

APRIL, 1961

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Construction Methods AND EQUIPMENT

A MCGRAW-HILL PUBLICATION

Q. and A.
With an Expert
On Central-Mix
Paving...92

Hydraulic Dredge
Places 2 Million Yd
Of Fill...100

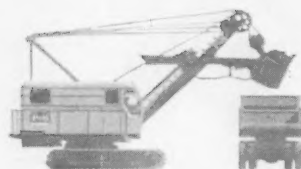
Forest of Falsework
Supports
Acre of Forms...143

COMPLETE CONTENTS, PAGE 4



At Denver, tractor with sheepfoot roller compacts fill covering underground missile base facilities.

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MUCH
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DOES
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Contractor gets trouble-free performance with Hi-Torque brakes on rough, hilly terrain

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On one project, the machines were in operation on rough, hilly terrain over a six months period, ten hours a day, six days a week. No adjustments, replacements, or maintenance of any kind was required. Dust and water are effectively sealed out, so the environment presented no ill effects. Automatic adjusters maintain proper clearance, adjust for lining wear.

B.F. Goodrich Hi-Torque brakes cut stopping distance approximately in half, compared to conventional two-shoe brakes. These brakes are now available on heavy dump trucks, tractor-scrappers, coal haulers, mine trucks, and other heavy off-highway vehicles, from several manufacturers. For information ask your equipment maker, or write *B.F. Goodrich Aviation Products, a division of The B.F. Goodrich Company, Department CM-4, Troy, Ohio.*



*Hi-Torque brakes permit safe operation
on faster cycles.*

B.F. Goodrich Hi-Torque brakes

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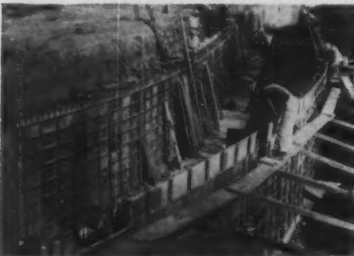
Extension Brackets and Symons Steel-Ply Forms

... enable contractor to pour at 15c a Square Foot

California contractor, Elmer J. Freethy saved substantially in pouring a channel lining for a flood control project at Pleasant Hill, California. It involved curved walls 9 ft high and 4,000 ft long.

Symons 8 ft Steel-Ply Forms were used with Symons New Extension Bracket, to get the additional foot. In addition to speed, the extension gave the final foot the appearance of a cap on the wall.

Wall specs called for a $\frac{1}{2}$ " extension joint every 40 lineal feet. The con-



Note extension brackets in foreground and minimum amount of bracing required for curved walls.

tractor had the $\frac{1}{2}$ " premoulded material cut 3" wider than the wall and used the wall forms to hold it in position. By using a 1" filler on these joints they were able to tie the forms together with long connecting bolts and pour the walls continuously.

Symons Steel-Ply Forms are rented with purchase option.



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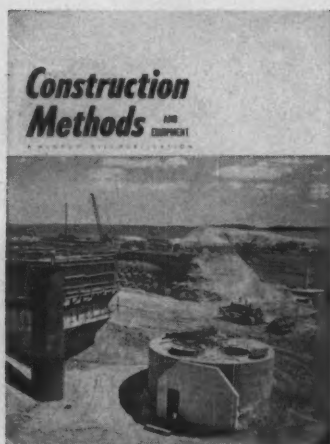
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APRIL, 1961

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Construction Methods

APRIL, 1961

Pay Dirt in This Issue

ON THE COVER

An Allis-Chalmers HD-21 pulling a dual-drum sheepfoot roller compacts backfill over underground missile base facilities near Denver, Colo. A joint-venture group headed by Morrison-Knudsen Co., Inc., built the labyrinth of tunnels, concrete-domed control structures, and silos that make up the Titan base. Other contractors in the joint-venture group are Olson Construction Co.; Johnson, Drake & Piper; F. E. Young Construction Co., and Paul Hardeman.

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NEXT MONTH

To guard against high water during construction of a bridge across the Red River in Louisiana, the contractor is building two water piers utilizing open caissons instead of open cofferdams. The caisson for one pier is made of concrete and was constructed on a sand island. The other caisson is made of steel and was floated into position in the river. The caissons for both piers were built simultaneously by the contractor.

Photo Credits—75 top left, Bureau of Reclamation; 75 top right, U.S. Army; 112-119, Roy Traham.

On-Site Yard Produces

Bridge Beams and Piles . . 86

Specially designed or modified equipment helps a contractor to mass produce 128,000 lin ft of prestressed piles and 1,512 52-ft-long beams for a 7,600-ft bridge at Biloxi, Miss.



Trucks Carry Rock

Over Sand Haul Road . . 96

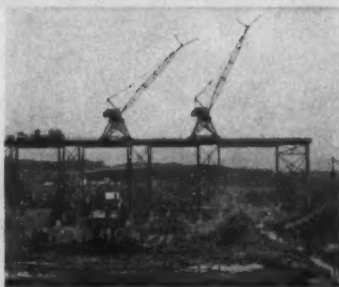
A 3-mi sprinkler system keeps the sand haul road in shape to support trucks carrying rock to a jetty repair job. At the site, a crane lifts each body off its chassis to dump it.



Big Cranes Trade

Tracks for Gantries . . . 123

Two 125-ton capacity cranes that have been lifted off their crawlers and placed on gantries on top of a 1,232-ft-long trestle are pouring all the concrete for Cowans Ford Dam.



Compact Multiple-Arc Welder Serves 24 Men 90

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Lake-Bottom Borrow Pit Supplies Runway Fill 100

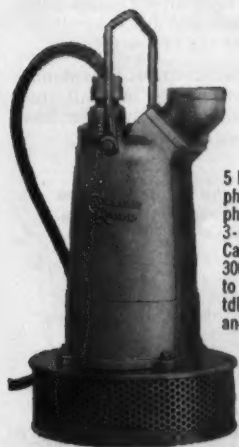
Prestressed Pipe Struts Brace Sheet Pile Wall 112

Forest of Falsework Supports Acre of Forms 143

Simple Casting Beds Turn Out 20 Piles a Day 157



It's Automatic...It's Electric...It's Unattended!



5 hp motor: single-phase 230 volt, 3-phase 220 volt, or 3-phase 440 volt. Capacity range from 300 gpm at 10' t.d.h. to 10 gpm at 120' t.d.h. Weight, pump and bale, 95 lbs.

On the Purdy Construction Company bridge job at Killbuck, Ohio (above) the Model 3VS1 submersible got its baptism of frost. Working on continuous service in midwinter, the pump proved its trouble-free dependability in zero cold.

You can put this rugged Gorman-Rupp submersible to work almost anywhere: leave it under water day and night, or under ice—let it pump dry and run that way for long periods—all without damage. The 3VS1 has only one moving part and three wearing surfaces, built specially to resist sand erosion. It is more compact, easier to handle and service, has fewer parts, costs less, has longer life and pumps more with less attention than other makes.

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ALPHA

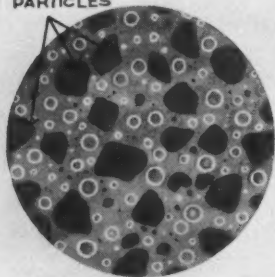
BETTER CONSTRUCTION THROUGH
BETTER USE OF CEMENTS

news and notes from the field

Where and How to Use Air-Entrained Concrete

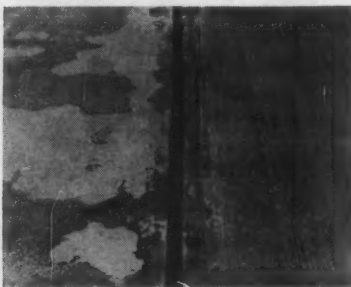
Cement Plus Air

SAND PARTICLES



When an air-entraining admixture is introduced into a concrete mix it forms literally billions of tiny air bubbles. Air-entrainment was originally developed to make concrete more resistant to the harmful effects of freezing and thawing action. It also provides a number of desirable side effects. It is more cohesive and workable. It results in less bleeding or surface water; there is less danger of segregation and trapped air pockets and it has less tendency to dust when steel trowel finished.

Air-Entrainment Prevents Scaling



Concrete pavement subjected to severe weathering and frequent applications of salt. The unscaled pavement on the right of the expansion joint was built with air-entrained concrete. The heavily scaled pavement on the left was built with portland cement containing no air-entraining material.

During severe winters some concrete pavements have revealed surface scaling as a result of freezing and thawing and from the direct application of salt to remove ice. The extent of the scaling depends upon the amount and frequency of salt application and the quality and age of the pavement. Extensive laboratory research and field experiments

show that concrete produced with air-entraining portland cement have excellent resistance to severe frost action and salt applications, provided salt is not applied too soon (never less than 6 weeks).

How Much Air

Best results with pavement mixes in which the maximum size of coarse aggregate is at least 1½ in. are obtained when the total air entrained in the concrete is as shown in the following table. For mixes in which the maximum size of coarse aggregate is less than 1½ in. the greater mortar content requires a somewhat higher total air content in the mortar.

Max. Coarse Aggregate Per Cent of Air

1½ in.	5% ± 1%
¾ in.	6% ± 1%
¾ in.	7½% ± 1%

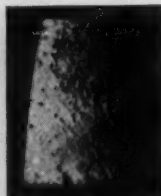
Where to Use Air-Entrained Concrete

In areas where severe frost action prevails or where repeated applications of de-icing agents are made, air-entrained concrete should by all means be used. Its excellent weathering qualities, increased cohesiveness and better workability make it decidedly superior for jobs such as concrete pavements, bridge floors, large garages, warehouse loading docks, etc.

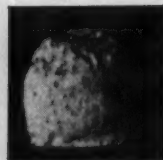
Mixing, Placing and Finishing

The mixing time for regular portland cement is also adequate for air-entrained cement. Inadequate mixing does not permit entrainment of sufficient air, and prolonged mixing may tend to decrease the entrained air. This makes it more important for the concrete user to be ready to place the concrete immediately after it has been mixed sufficiently to avoid prolonged mixing.

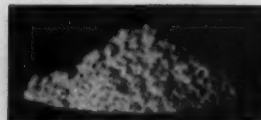
Air-entrained concrete can be readily handled and spread because the mix is very workable and cohesive, and is not apt to segregate. *Wheel, shovel or chute the mix into place, but do not flow.*



Good if vibration is used



Maximum slump



Too wet—will cause stickiness

Use a relatively dry mix with air-entrained concrete—not over a 4-inch slump on a damp sub-grade, and if vibration is used, the slump should not be over 1 inch. A dry mix is much easier to finish than a wet one.

Tips for Best Results

1. Be sure that air-entrained concrete is used on all exposed work where the job will be subject to freeze-thaw cycles. Air-entrainment is not a "cure-all", but is effective if the rules of good concreting are observed. It protects even some lean concrete against freeze-thaw damage.
2. Make sure that air-entrained concrete is at least 6 weeks old before subjected to salt or calcium chloride applications.
3. Be sure the air content of air-entrained concrete is sufficient (see table). If the air is too low, even air-entrained concrete can be damaged by freeze-thaw cycles—especially the first winter.
4. Encourage closer control of the slump for all work done in the late fall and winter—the sloppier the mix, the less effective the air-entrainment.

Reprints of the information on this page are yours for the asking.

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CONSTRUCTION METHODS

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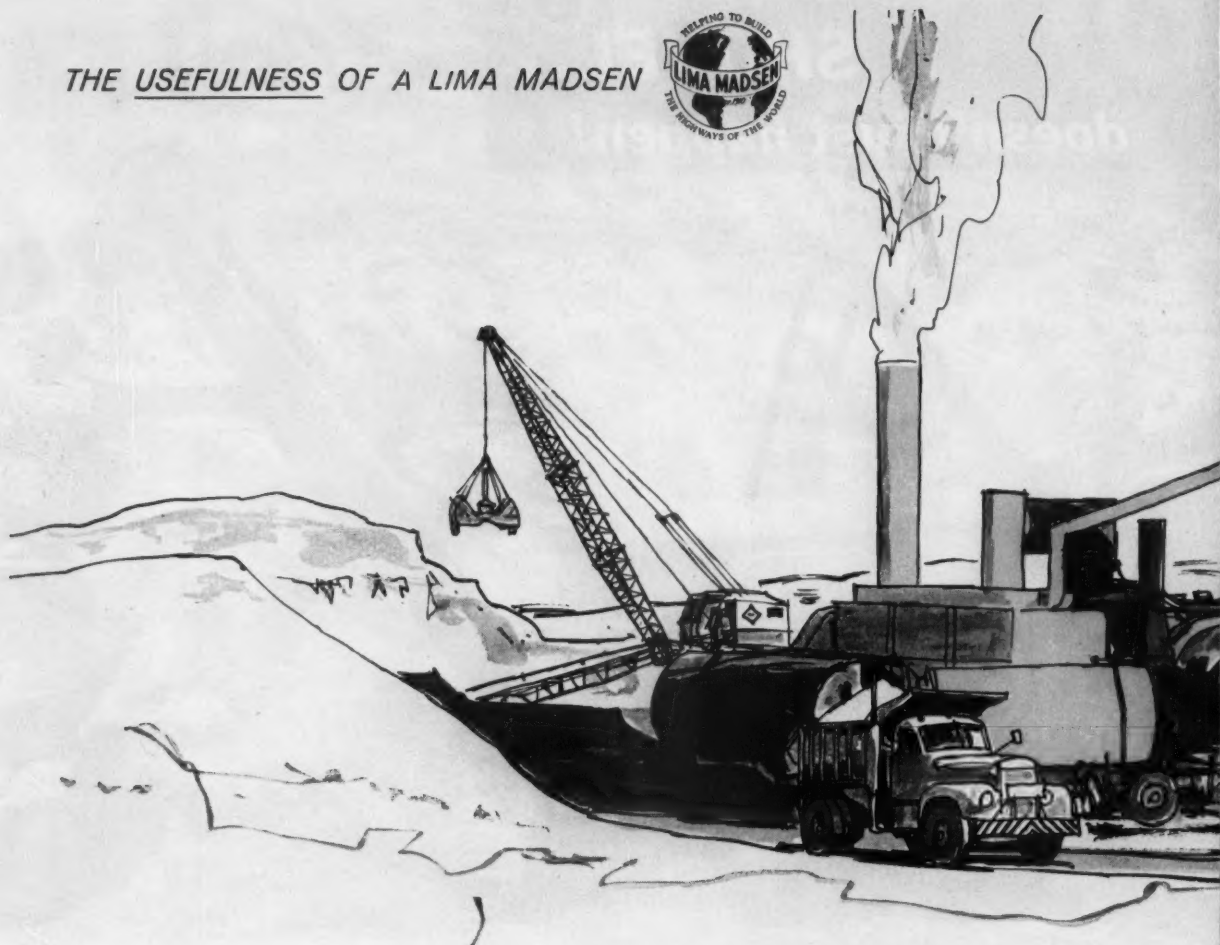
It's a rock rig through and through with the advantages that assure output—not just for today—but for tomorrow, month after month.

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THE USEFULNESS OF A LIMA MADSEN



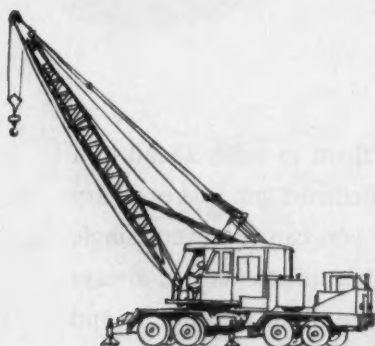
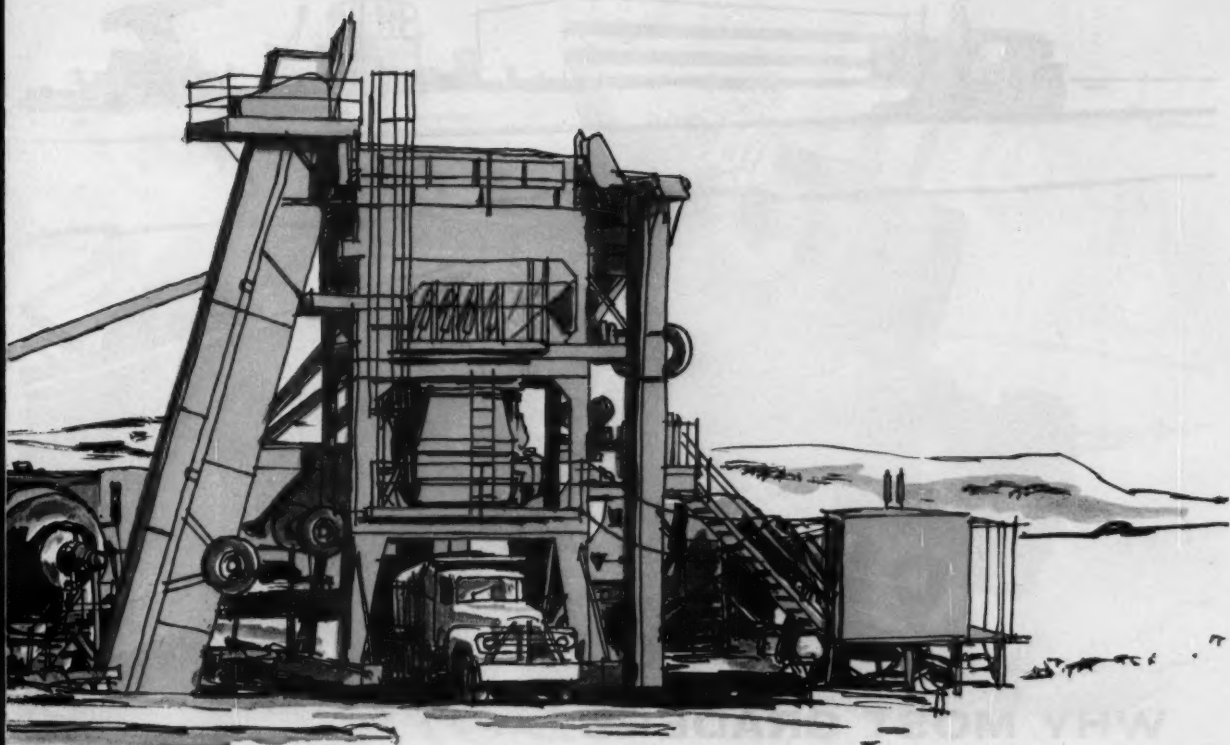
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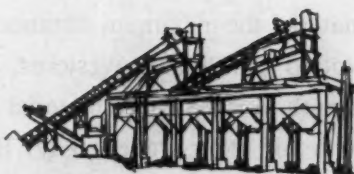
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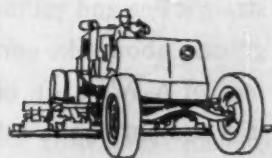
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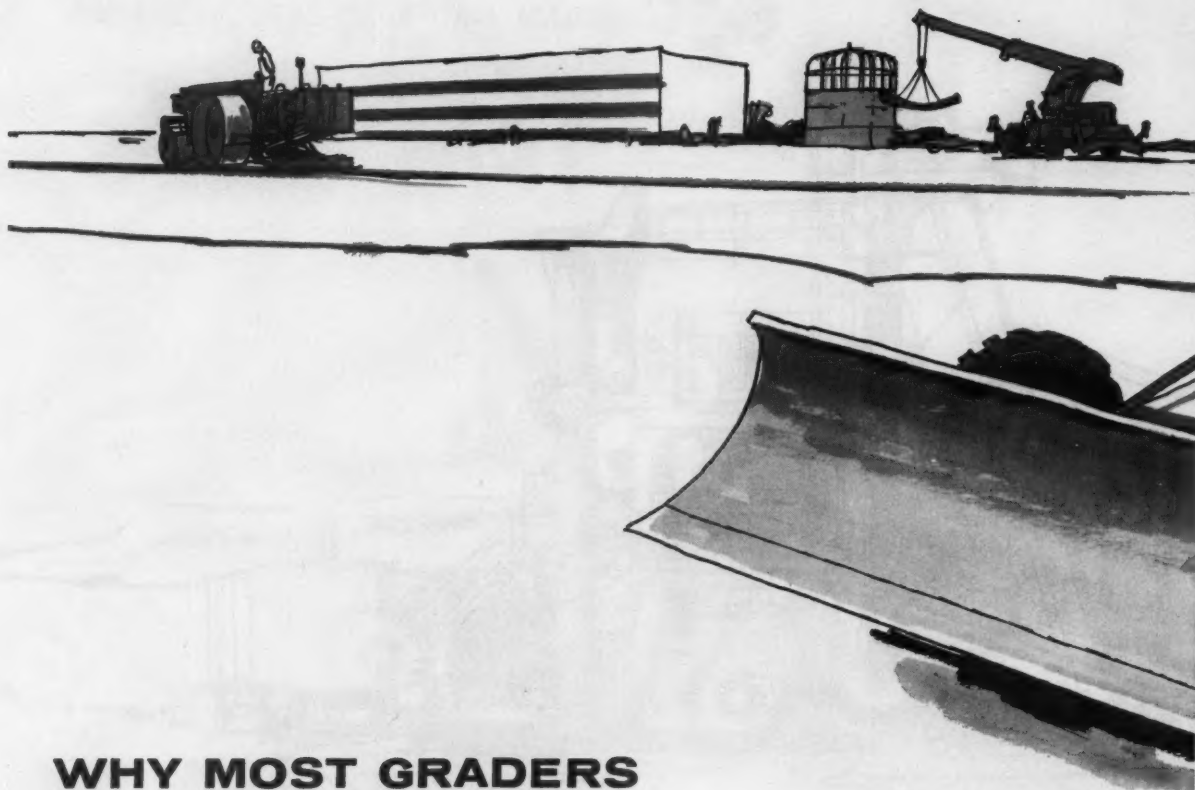
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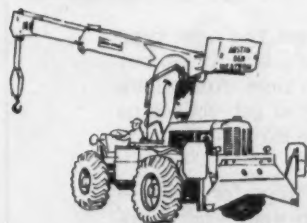




WHY MOST GRADERS CANNOT USE FULLY LOADED BLADES

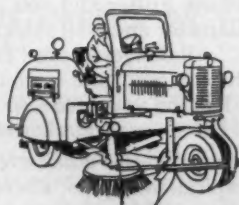
With a fully loaded blade it would be nearly impossible for them to work ahead in a straight line and yet move material the maximum distance. Sidethrust can toss ordinary graders about like corks. Not so with Austin-Westerns. For you can use every single inch of A-W's 13-ft. blade length to move more material farther and faster . . . always in a straight line . . . than with any other grader. *Why?* Because of all-wheel drive and all-wheel steer. No front-end dead weight means balanced power at the blade. Rear steers, too, so operator can offset the machine to eliminate all sidethrust at the toe of the blade to permit use of its full length.

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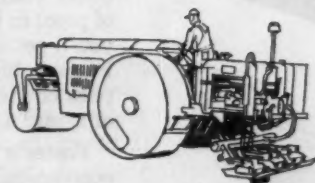
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Construction News From Washington

Washington, D.C.
April, 1961

Anti-Recession Measures Boost Construction

Contractors can count on more than \$100 million of new federal construction starts in the next 90 days, and Congress is acting on a half-dozen Kennedy programs that recommend longer-lasting step-ups which would swell contract awards by billions of dollars in the years beginning July 1.

An increase of over \$100 million in new construction awards was spelled out by the agencies in reports telling the President what they could do to carry out his directive for an anti-recession speed-up. The agencies telescoped their construction schedules to start \$16 million of additional work by the end of March and another \$100 million during April, May and June. The beefing-up will be accomplished in part by awarding contracts previously programmed for next year.

Agency by agency, the increases amount to: Dept. of Defense military construction, \$32 million; Health, Education and Welfare, \$27 million; Federal Aviation Agency, \$19 million; Interior Dept., \$16 million; Corps of Engineers, \$9 million; and all other federal programs, \$13 million.

Bigger Programs Depend on Congress

While the agencies accelerate contract awards, Congress is debating the President's weightier proposals that could mean billions to construction. Kennedy has called for an additional \$800 million a year to complete the \$41-billion Interstate Highway System by 1972; \$3 billion to spur housing construction and support major rebuilding of our cities; \$2.8 billion for new, better-staffed schools, and \$100 million a year for sewage treatment works. He also wants to upgrade natural resources development above the current federal expenditure level. This would result in a major boost in the \$1.25 billion now being spent by the Corps of Engineers and the Reclamation Bureau.

Enactment of these and other programs involving many billions of dollars worth of construction activity hinges on agreement among contending groups in the Congress. Segregation and similar issues—emotional and political—create divisions in the Congress that could delay or defeat the President's construction measures.

On many of the programs, the White House and the Democratic leadership in Congress will have a tough fight ahead to win a narrow majority for acceptable compromise legislation.

continued on next page

Fuller-Webb Win Missile Contract

Heavy construction contractors are watching with interest to see what develops on the Montana Minuteman job that George A. Fuller Co. and Del E. Webb Construction Co. won for \$61.7 million on a fixed-price, incentive-fee contract. Six bidders offered proposals to the Corps of Engineers on the second go-around for control centers and 150 hardened launching silos at Malmstrom Air Force Base.

The Ballistic Missile Construction Office of the Corps rejected first-round fixed-price, lump-sum bids because the lowest of four tenders was \$28 million above the \$50.8-million estimate for the project.

Contractors generally have made little criticism of Brig. Gen. Alvin C. Welling's CEBMCO organization, created last August to bring order out of the missile base mess. The constructors recognize the difficult position of the Corps, which is assigned responsibility to build bases for missiles that are still under development, with the Air Force having the final word on what goes into the job.

The fixed-price, incentive-fee experiment at Malmstrom is an attempt by the Air Force to do what it has long desired—place construction on the same cost-plus basis as all the other contracts of the missile program without violating the directive of Congress that the missile bases be let on competitive lump-sum bids.

An incentive-fee contract as used for the Montana Minuteman job involves negotiation after the bids are opened. CEBMCO negotiated only with the low bidder.

Under the Malmstrom contract as negotiated, the contractor gets from 20 to 25% of cost savings below the target price and pays the same percentage of costs above that target figure. Negotiations also fixed upper and lower cost limits. Should costs rise above the upper limit, the contractor pays 100% of these costs.

Contractors Impress Missile Committee

Contractors who appeared before the House Military Construction Appropriations Subcommittee last month (CM&E, March, p. 13), appears to have made their point that existing missile base construction problems were due to factors beyond their control. The subcommittee, which has been investigating charges of excessive costs and delays, last month directed the Secretary of Defense to "take immediate steps to bring order and proper direction to the program and to provide this nation with an ICBM base construction program that will meet the operational needs of our defense forces in a realistic manner . . ."

Specifically, the subcommittee criticized the "abnormally large number of change orders and modifications" and the division of responsibilities between the Air Force and Corps of Engineers.

Excessive change orders and a lack of centralized authority were the two points brought out by the contractors' testimony.

The subcommittee criticized the "inadequate authority of contracting officers to properly negotiate change order settlements with contractors." The contracting officer, said the subcommittee, "has been drastically hampered by far too many people constantly looking over his shoulder and by restrictions placed upon him not to exceed a certain percentage of the government estimate."



Q: What do Goodyear Earthmover Rims have that no others have?

A: MORE times FOUR

- 1. MORE rims on the job:** More tons are hauled on—more earth-moving equipment rides on Goodyear rims than on any other kind. Result: You reap the benefits of the widest, soundest experience in rim design, manufacture and use.
- 2. MORE kinds of rims:** Maximum rim performance stems from proper specification. Goodyear makes the *only complete line* of earthmover rims. Result: The choice that permits you to get exactly the right rim for the job.
- 3. MORE rim engineering help:** Goodyear has more engineers designing *and selling* rims than any other company. And they know tires, too. Result: The help you need in choosing the right rim for top performance—longer tire life.
- 4. MORE rim "firsts":** The first *true* earthmover rim, the first 5° rim, the first tubeless rim—in fact, every major earthmover rim advance was made by Goodyear. Result: The very latest in rim design and manufacture at work, for you.

What better reasons for choosing Goodyear as your rim supplier? Only these: The desire and ability to design and build any rim that may be needed for *tomorrow's* earth-moving equipment. No matter what your rim needs or plans, you'll find it pays to call on Goodyear. See your local rim distributor, or write: Goodyear, Metal Products Division, Akron 16, Ohio.



GOODYEAR
EARTHMOVER RIM
FEATURES:

40% stronger, only
6% heavier

Heavy-duty, nonslip
band driver

Positive air seal

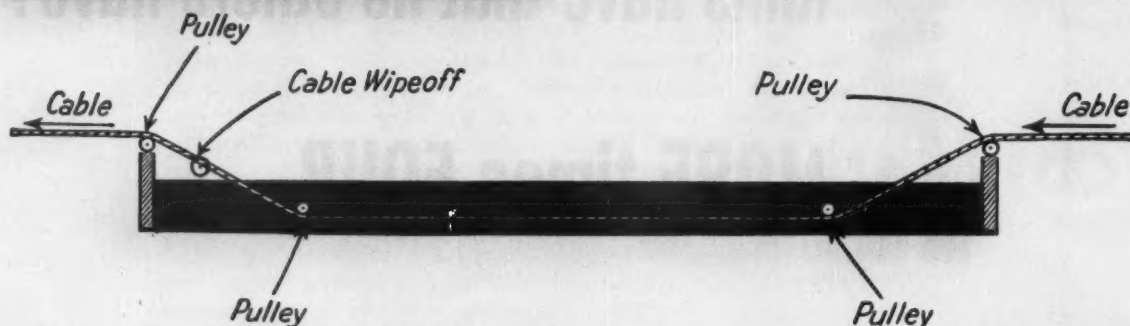
Corrosion-resistant
Bond-A-Coat finish

Lots of good things come from

GOODYEAR

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LUBE LOGIC 5 new ways



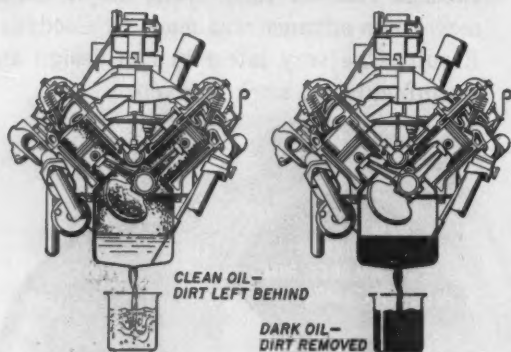
Warm bath restores wire rope

The best way to get lubricant inside a cable, where it's really needed, is to immerse the cable or wire rope every 500 hours or so in a bath of warmed-up Texaco Crater A lubricant. It pays off by giving you far longer service life than you would get simply by applying Crater A externally.

This warm-bath treatment requires a horizontal trough to hold the lubricant. The trough should be fitted with pulleys to keep the cable completely submerged while it's passing through. A burlap collar should be rigged to wipe

off excess lubricant as the cable leaves the box. An immersion of about a minute will allow the lubricant to work well into the strands.

This process is *not* an alternative to other lubrication. You should continue to clean the cable and apply Crater A externally every 10 to 100 hours, depending on the type of work the cable is doing. Remember also to be very sparing with lubricants on cables that wind on clutch-equipped drums, and never lubricate cables that are dragged in dirt.



Dark engine oil... sign of a hard worker

Here's a motor-oil misconception that's still common enough to need discussion. Some folks think that the better an engine oil is, the more likely it is to come out as clean as it went in. The truth of the matter is just the other way around. A good detergent-dispersant oil holds onto dirt like an old friend. It keeps dust, soot and carbon in suspension, and carries it out of the engine when you drain the oil. Oil that looks clean when you drain it from the crankcase is a sign that these contaminants may still be inside the engine. Moral: oil that darkens in use is really doing its job.



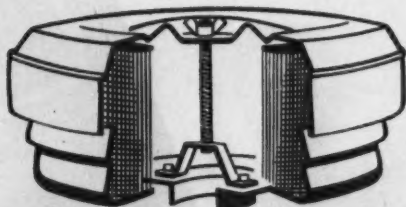
No-sweat way to adjust crawler treads

Crawler treads are easier to adjust if you dab a little Texaco Threadtex on the adjusting screws. The Threadtex stays put through months of service, keeps the screws free-turning and corrosive-proof. Another good use for Threadtex is on track bolts, when you're making up track. A little dab of Threadtex on the bolts will save a lot of time and work in taking down track after it has been in service.

to trim downtime

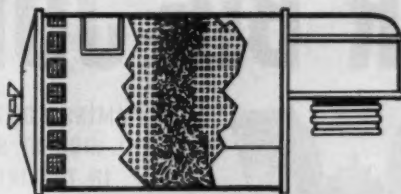
Key points on air filter maintenance

In a day's operation a typical engine inhales several thousand cubic feet of air, and on a construction project all that air is probably loaded with abrasive dirt and dust. Good air-filter maintenance is the only way to make sure your engine gets the air and *not* the dirt. Here are some maintenance tips that will keep your air filter working better through thick and thin.



Dry type air cleaners (the ones with the fluted paper element) should simply be shaken or tapped lightly to remove dirt, and reinstalled. Never clean dry-type elements with kerosene or diesel fuel.

Additional precautions: empty centrifugal pre-cleaners when the glass container is half full; don't remove the oil cup when the engine is running.



If your filter is the **wire gauze type**, and you want to re-use the element, wash the gauze in kerosene or diesel fuel, shake it dry (*don't* blow it with compressed air) and re-oil it with SAE 40 or SAE 50 oil to coat the element.



Oil-bath type air filters won't function properly if there's more than a half inch of sediment at the bottom of the oil reservoir. Check the sediment level by sticking a screw-driver down into the oil, and if you're anywhere near the half-inch level the bowl should be cleaned out and refilled. Also, inspect the filter every 5 to 50 hours to make sure the oil itself is at the right level. Every 500 hours the whole cleaner should be dismantled and cleaned, and refilled with new engine oil of the same grade used in the crankcase.

New Texaco movie can help boost your profits



This factual, down-to-earth presentation shows you how 1% of your total budget (the amount usually spent on lubricants) can minimize a major cause of equipment downtime.

SEE: How the biggest engineering job ever undertaken was 90% lubricated with only *four* different products.

SEE: How one contractor lubricated 21 different types of equipment with only seven products.

SEE: "When the Wheels Stop, Your Profits Go" — Texaco's newest sound and color movie.

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Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Man is your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

APRIL, 1961

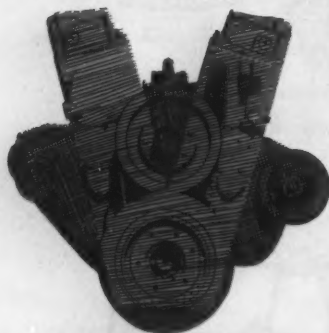
TUNE IN: TEXACO HUNTLEY-BRINKLEY REPORT, MON. THROUGH FRI.—NBC-TV

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BIG POWER FOR BIG JOBS!



**CUMMINS V DIESELS DELIVER
THE HIGHEST HORSEPOWER
IN THE INDUSTRY!**

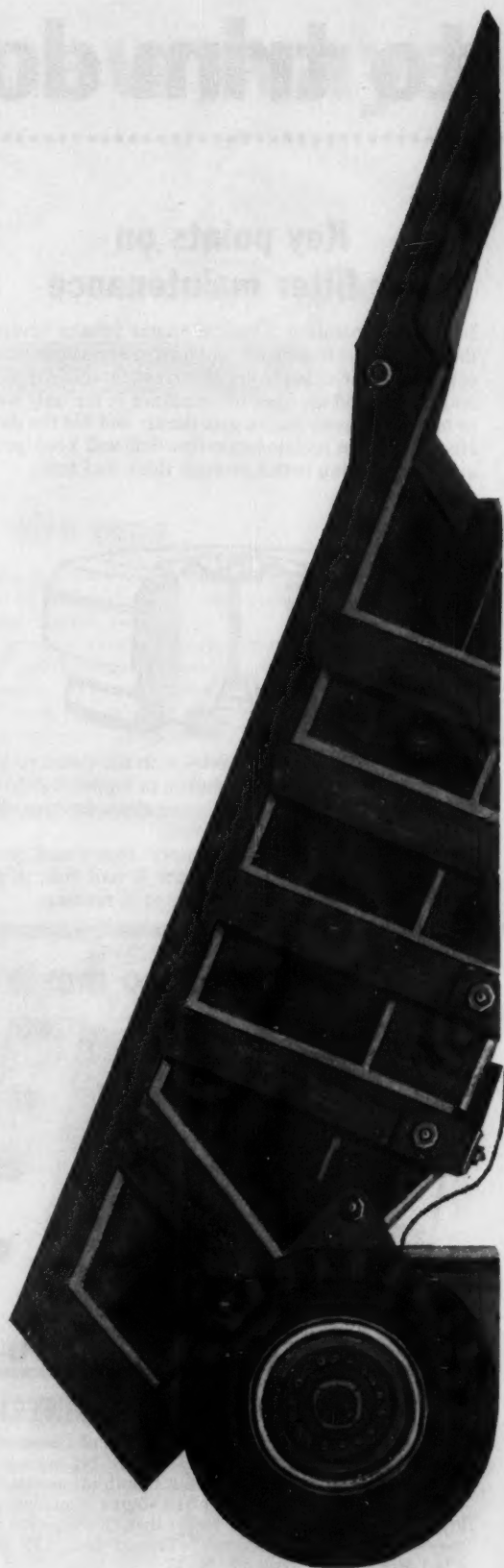
Cummins big bore diesels—from 350 to 700 hp—finish off the big jobs fast! These V engines are in a class by themselves. They are the only diesels delivering up to 700 hp in mobile equipment.

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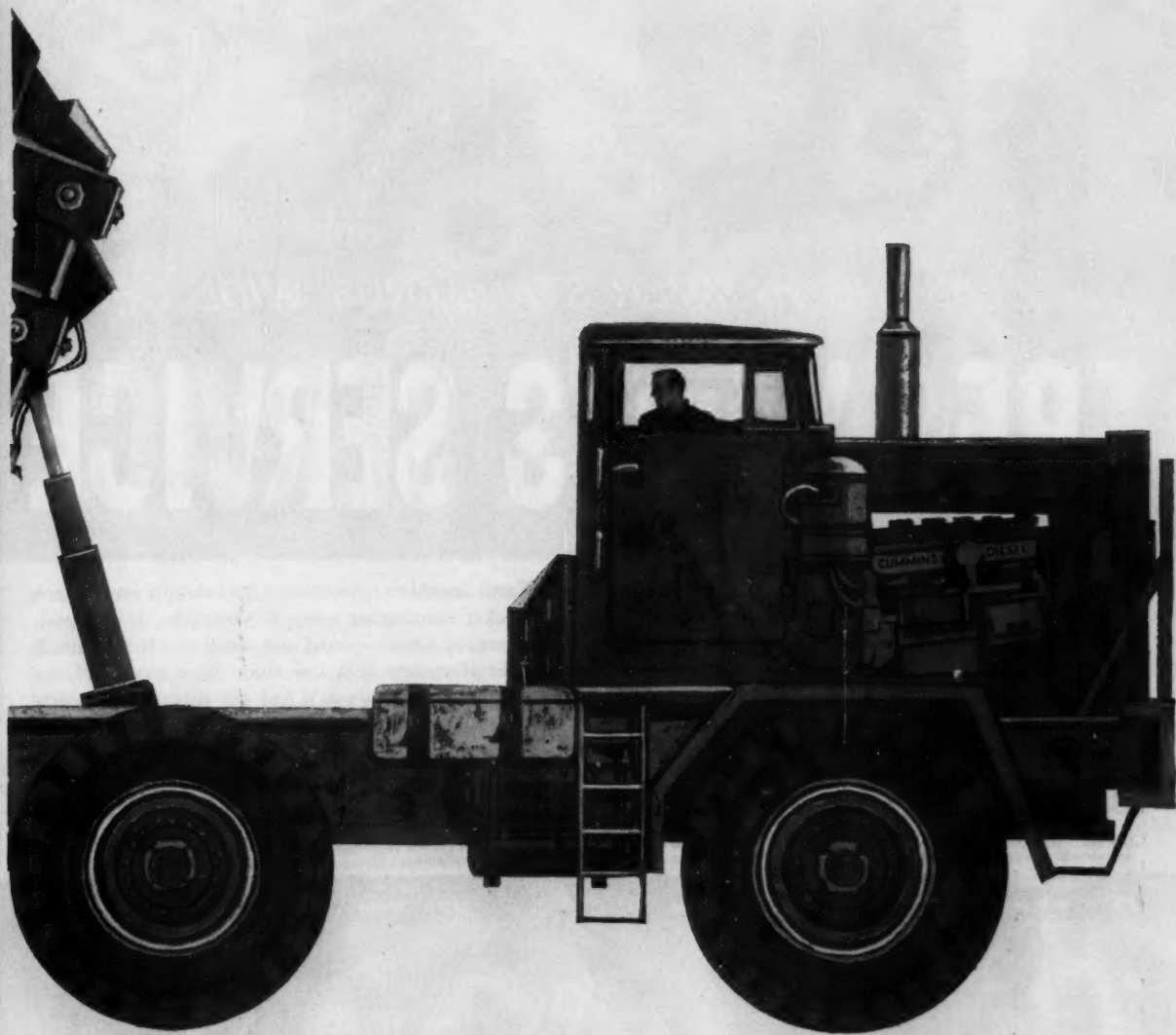
Make the wise investment—specify Cummins V Diesels for your equipment. Buy the most productive, highest horsepower available. Get the extra measure of Cummins dependability—the time-tested, work proven Cummins design and features that add extra years of on-the-job performance. Contact your equipment dealer or Cummins Distributor for the specific details on these big power diesels.

Cummins Engine Company, Inc.,
Columbus, Indiana

CUMMINS



350 HP
430 HP
450 HP
525 HP
600 HP
700 HP



APRIL, 1961

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19



BLASTING HAMMER STANDARDS WIDE OPEN!

FREE YEAR'S SERVICE

You've heard B&D Hammers are tough! You've heard they're practically maintenance-free! Now Black & Decker *proves* its faith in these rugged tools with a certificate good for free service and parts for a year.

***You don't pay a penny for normal maintenance during a whole year of operation, under the terms of the service certificate.**

There are other reasons why you should want Black & Decker hammering away at your jobs. Initial cost, for example. Check around and you'll find that Black & Decker Hammers cost less than other makes of the same capacity. Also you'll find the maintenance costs on B&D Hammers low in relation to output.

More reasons? Look to Black & Decker versatility

B&D HAMMERS COMBINE VERSATILITY WITH POWER TO GIVE YOU

Use B&D Hammers for channeling, chiseling, digging.

Use B&D Hammers for setting shields, drilling, piercing.

Use B&D Hammers for slotting, caulking, breaking.

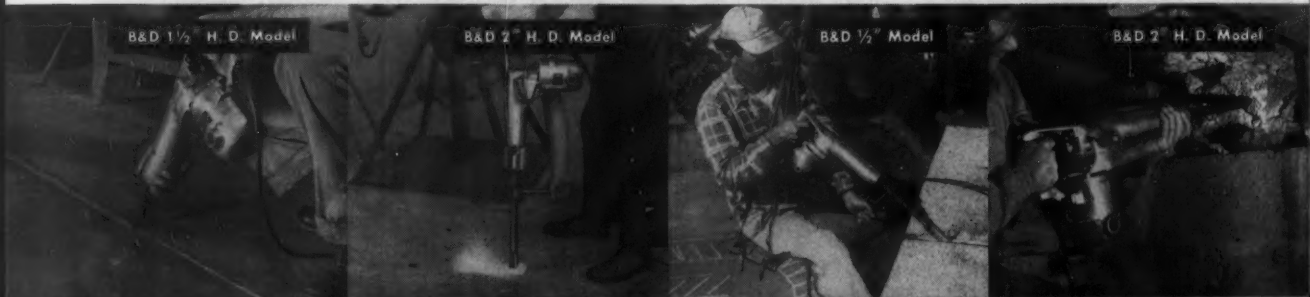
Use B&D Hammers for smashing, battering, shaking.

B&D 1½" H. D. Model

B&D 2" H. D. Model

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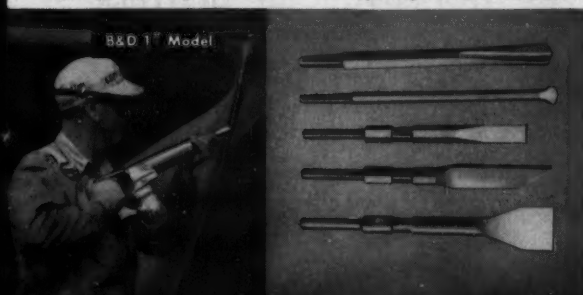
ALL PARTS AND LABOR*

and power. Whichever of B&D's four hammer models and many accessories you need . . . whatever the job . . . Black & Decker's exclusive spring-and-compressed-air power transmission delivers tremendously effective IMPACT per blow for faster work, better work. Ask now about the free service certificate with B&D Hammers. Sold by leading distributors everywhere.

MORE WALLOP, MORE WORK!

Use B&D Hammers for cleaning, shaping, peening.

Use B&D accessories designed especially for B&D Hammers.



For Black & Decker sales or service, look in the Yellow Pages of your telephone book under



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CUTS MAN-HOURS TO MINUTES

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- ☐ Please send me 20-page hammer handbook
☐ Please arrange for a demonstration of.....

Name.....Title.....

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☐ Impact Wrenches



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tools. Black & Decker maintains 50 factory service branches plus authorized service stations to give your B&D tools the attention mechanical products need periodically. Keep your B&D tools in top condition, on the job all the time.

Only factory parts and factory-approved methods are used. Fast service and reasonable cost, always.



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 be sure to ask about:

FREE TOOL INSPECTION
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 no obligation.

**STANDARD B&D
 GUARANTEE** after
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Quality Tool Service

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Job Talk...



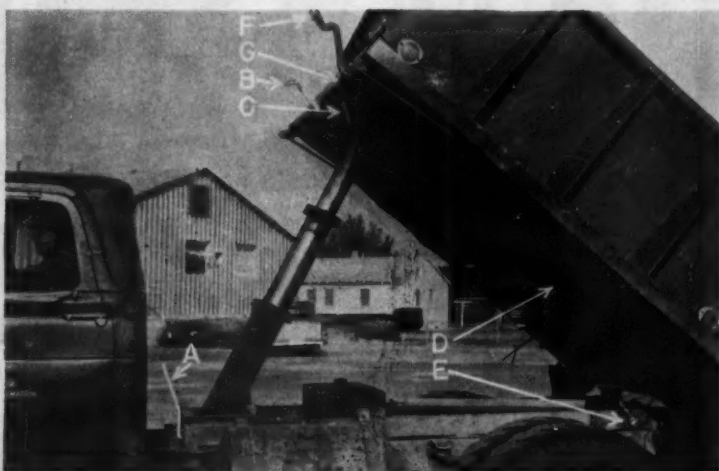
Transit-Mix Trucks Huddle to Pour Caissons

Pouring caissons with five or six transit-mix trucks unloading at one time chopped an estimated 40 days off the construction schedule of an elevated roadway and bridge at Chicago's O'Hare International Airport. Case Foundation Co. of Roselle, Ill., devised the multiple pour method.

The job called for 94 caissons

ranging from 3¼ to 5½ ft in dia. Depth varies from 55 to 60 ft. Bells at the bottom are 14 ft dia.

Close teamwork with the concrete supplier, Material Service Corp. of Chicago, kept enough trucks on hand at the site to pour simultaneously. The Case crew chalked up a single day's high of 250 yd of caisson concrete poured.



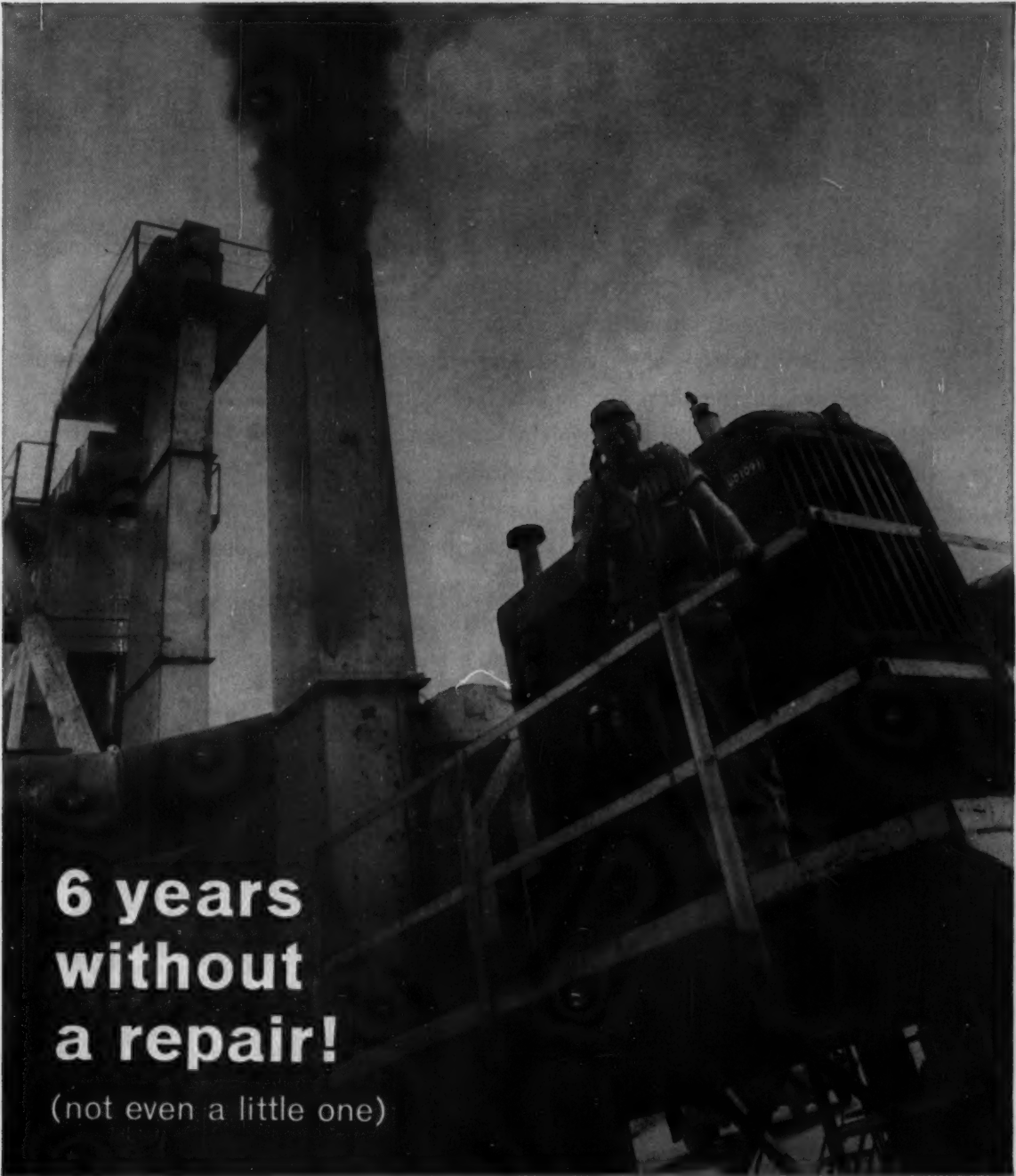
Automatic Device Works Tailgate of Truck

A device that operates off the tailgate locking handle of a dump truck automatically opens the tailgate at a predetermined angle. It also automatically locks the tailgate when the dump body is

fully lowered. Two Bureau of Reclamation employees, Lee Goodson and Leland Willingham, developed the device on the Central Valley Project in California.

continued on page 28

CONSTRUCTION METHODS



**6 years
without
a repair!**


(not even a little one)

This diesel has been powering an asphalt plant for six years. *And not one repair*, major or minor, has been made on the engine in all that time, thanks to proper preventive maintenance and Cities Service DC-300 oil!

To the Rein, Schultz and Dahl Company of Madison, Wisconsin, it is trouble-free operation such as this that plays so vital a role in running a profitable business. That is why they use

Cities Service DC-300 oil, exclusively, in all their engines.

New DC-300 is one of the most important developments in diesel engine lubrication. It prevents sludge and clogging, stops rust and corrosion, and contains a special anti-wear additive to increase engine life. For information call your local Cities Service Office, or write: Cities Service Oil Company 60 Wall Street, New York 5, New York.

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QUALITY PETROLEUM PRODUCTS

JOE IS PROUD OF HIS

Good reason, too! He's got a 9-inch down-the-hole bit from Sandvik-Coromant, and that means he's got a bit that's better than he's ever used before!

Strong statement? Sure. But here's proof:

First, Sandvik is one of the world's largest and most experienced manufacturers of tungsten carbide. Therefore, Joe gets the highest quality carbide possible. From more effective refining, through better mixing, to more careful control of grain size—everything possible is done to assure Joe longer bit life and more feet between sharpenings.

More proof: Sandvik carbide inserts *stay in*, thanks to our unique brazing method. And since the entire bit is made from Swedish steel—Joe knows breakage won't be a problem.

You'll be happy with Sandvik-Coromant down-the-hole bits, too. They're available from 4¼ to 9 inches in diameter, and for all types of rigs. Get in touch with your nearest Atlas Copco office today, or write to Dept. CM-61-1.



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New Barber-Greene

Latest addition to Barber-Greene Finisher line is a new step forward in advanced design and superior performance.

Barber-Greene's Model SA-40 is a new achievement in ease of operation and automatic features, combined with simple construction for greatest accessibility and ease of maintenance.

Its wide range of paving speeds to 100 FPM. and travel speeds to 4 M.P.H., together with its many other features assure the greatest tonnage production every hour—day and year of its long life.

Some of its outstanding features are shown below. Whether you are in the market now or not,

you should be familiar with all of the advantages of this completely new modern design. Your Barber-Greene distributor will gladly give you full information. No obligation.

Only Barber-Greene Offers You Five Choices
COMPACT: Model 873, paves on crawlers, travels on rubber.

GENERAL DUTY: Model 879-B and new Model SA-40.

HEAVY-DUTY: Model SA-60 on Crawlers and Model SB-60 on Pneumatics.

NEW EASE OF OPERATION.

Joystick, power-assist steering. Switches on joystick control self-dumping hopper, screed hoist, etc.

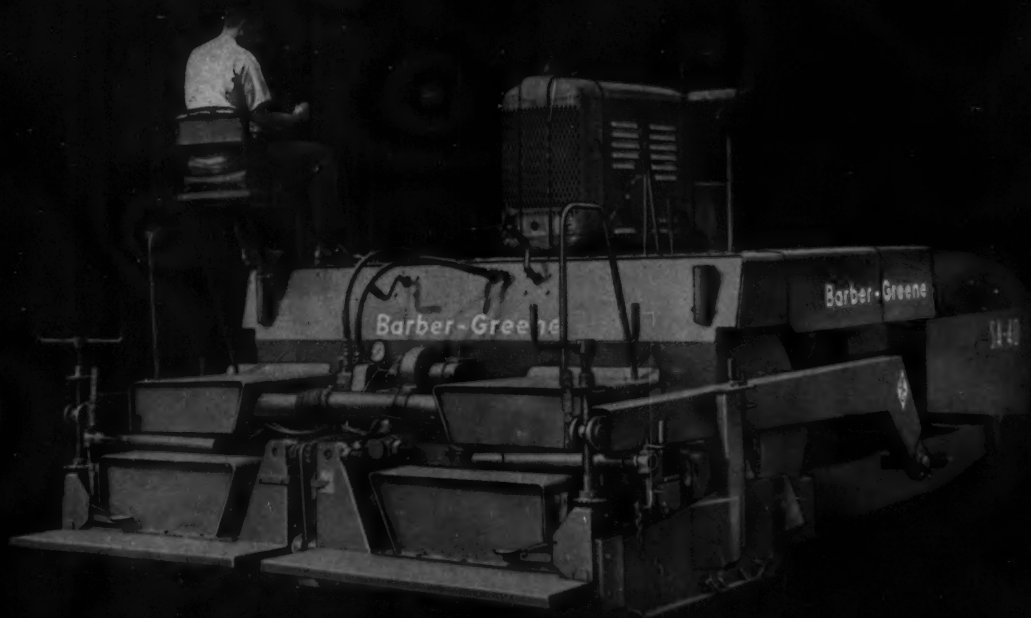
HYDRAULICALLY SELF-DUMPING HOPPER.

Tunnel extends to rear of chassis for maximum capacity and fastest truck dumping. Hopper gates controlled from screed platform while paving.

HEAVY-DUTY LONGER LIFE

SCREED. Hydraulically operated, high speed tamper compacts before strike-off. Improved automatic leveling. Twin screed heaters.





SA-40 Finisher



Model SA-40 paves standard 10' widths—variable from 8-14'. Handles all asphalt mixes. Carries shift-long fuel supply in 28-gal. tank.

World's No. 1 Manufacturer of Asphalt Paving Equipment

Representatives in Principal Cities of the World

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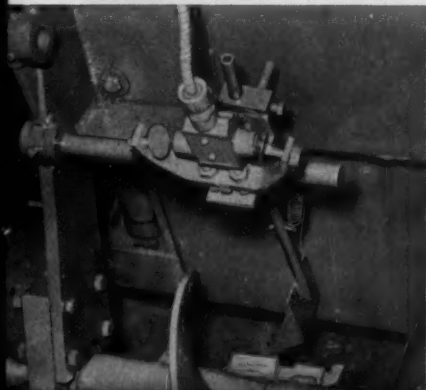
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AUTOMATIC FEEDER CONTROL operates each pair of feeders and screws independently. Override switches on steering column.

OSCILLATING PUSH ROLLERS pick up trucks on-the-fly regardless of alignment. New long crawlers provide the ultimate in traction, leveling, and stability.

SIMPLIFIED SERVICING achieved through unitized construction and simple, efficient power train. Hinged deck plates for easy perimeter access.



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safest and
surest way to...
a Leakproof
Hose Connection

PUNCH-LOK HOSE CLAMPS

LOOK!
It's "Loked"
for Safety

See Your Distributor
or write direct for catalog and prices



The Sign of a GOOD Hose Clamp

PUNCH-LOK
Company

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JOB TALK . . . continued from page 22

Here's how it works. An adjustable anchor (E in photo) fastened at the rear of the truck frame holds a light cable (D) that is threaded through eye bolts welded to the bottom frame of the dump bed. The other end of the cable is attached to a fixed lever (C) on the tailgate locking-handle head rod (G). As the dump body is raised, the cable tightens, pulling the lever and tripping the tailgate. The angle of the dump body at which the

tailgate opens is set by adjusting the length of the cable.

Another lever (B) is fastened to the tailgate locking-handle head rod parallel to the standard locking handle (F). As the dump body is lowered, this lever strikes a slotted bar (A) welded to the truck frame in back of the cab. The slotted bar moves the lever, which turns the head-rod to the locking position. This locks the tailgate until the body is raised again.



Contractor Drives Sheet Piles in Stages

Two-stage driving speeded installation of a lightweight sheet-pile bulkhead for a marina in Yellowstone Park. Charles M. Smith General Contractor of Thermopolis, Wyo., used a light, easy-to-handle hammer to tap in the sheets, then completed driving to final grade with a heavier hammer. By matching hammer size and driving resistance, the contractor attained good driving economy.

After excavating along the 1,146-ft bulkhead, Smith's crew drove temporary timber piles on 15-ft centers about 2 ft outside the wall line. Knee braces from the timber piles held a guide rail to maintain alignment of the sheeting during initial driving.

A Koehring 305 crawler crane with a McKiernan-Terry No. 2

hammer partially drove 20-ft-long L. B. Foster 1210 sheetpiles along the wall. Every eleventh and twelfth sheet was driven to final grade and tack-welded to a top wale consisting of a 10-in. channel. This prevented sanning (progressive tilting of the piles because of play in the interlock). Later, a McKiernan-Terry No. 3 hammer drove the piles to final grade. A two-man crew rode along with the hammer on a work platform suspended from the hammer cable.

In addition to the top wale, a bottom wale helped brace the 10-ft exposed length of the sheeting. It was made up of two 3-in. channels placed back to back and held apart by 3/8-in. steel plates at 5-ft centers. Both

continued on page 32



From bid to final building—you can be protected all along the way by The Travelers umbrella of protection. Starting with your bid—you can call Travelers for efficient, expert service when you want a bond, want it *right*, want it *right away*. When you are on the job, you'll need Workmen's Comp and

Public Liability Insurance—including Travelers famous safety service. And you can protect your investment as it grows with Builders' Risk insurance and a Contractors' Equipment Floater. Get them *all* from *one* man—for convenience and reliability—your Travelers representative.

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J. F. White Jr., President
J. F. White Contracting Co.



Thomas J. White, Treasurer
and General Manager

Joseph F. White Jr., president, and
CONSTRUCTION METHODS subscriber
since 1948, says:

“ I find **CONSTRUCTION METHODS** magazine valuable for its ideas on construction techniques that are applicable and helpful to us. Its coverage of equipment maintenance and use is especially useful. I read the advertisements, too, for applications of new equipment. ”

White's Equipment Inventory

- 13 cranes and shovels—(Northwest, P&H, Keckring, Lorraine)
- 16 crawler tractors—(Caterpillar, Allis-Chalmers)
- 3 tractors
- 4 front end loaders—(Michigan, Pettibone-Muliken)
- 3 gradalls
- 2 rock rippers
- 3 graders—(Caterpillar)
- 12 scrapers—(Caterpillar, Euclid)
- 6 bottom dumps—(Euclid)
- 24 dump trucks—(Autocar, Mack, Ford)
- 13 pickup trucks—(Ford)
- 4 complete lubrication units
- 8 trailers—(LaCrosse, Rogers)
- 3 mobile truck-mounted welding units
- 4 asphalt spreaders—(Barber Greene)
- 2 bituminous distributors—(Etnyre)
- 4 stone spreaders—(Jersey, Buckeye, Good Roads)
- 8 rollers—(Buffalo-Springfield, Huber Waco, Gailon)
- 5 compactors—(Jackson, Ferguson)
- 17 welding machines—(Hobart, Westinghouse, P&H)
- 5 generators
- 29 pumps—(Gorman Rupp, Jaeger, Griffin Wellpoint)
- 4 self-propelled rock drills
- 5 compressors—(Ingersoll Rand, LeRoi)
- 4 pile hammers—(McKlarnan Torry, Vulcan, Linkbelt)
- 4 barges
- 2 pile extractors
- 19 mobile radios—(Motorola)
- 4 base stations—(Motorola)
- 1 remote control unit—(Motorola)
- 18 miscellaneous trailers (parts, office, tankers, etc.)
- 3 asphalt plants—(Cedar Rapids)
- 1 asphalt plant—(Hetherington & Borne)
- 2 complete stone crushing plants—(Tel-Smith)

DIVERSIFIED

...help boost J.F. White

There are approximately 3,500 contractors who do \$1 million or more of construction a year. Included in this nucleus of America's most important contractors is the fast-rising, successful J. F. White Contracting Company of Westwood, Massachusetts.

The company's beginning can be traced to 1924 when Joseph White, Sr. engaged in drainage and earth moving with horse drawn scrapers. The depression years that followed forced Mr. White to concentrate his efforts to the White Fuel Corp. which became the largest independent fuel distributor in New England. It was not until 1946 that the contracting phase of the company was re-activated by his sons, Joseph F. White, Jr., and Thomas J. White. Mr. White Sr. functioned in an advisory capacity for the construction company.

White expanded capacity and volume rapidly

With only two trucks and a shovel, the company started bidding on state and municipal road work. Their first contract was a \$15,000 road job that included paving. At that time, the company had to rent much of the equipment that was needed.

Within a few years the company had expanded its drainage and earthmoving work to include the construction of highways and marine structures such as piers and sea walls. In 1950 the company won a \$750,000 job and in 1952 a \$2.5 million contract. As the work volume increased, J. F. White purchased more and more new equipment to increase their capacity and efficiency. With the White brothers, Joseph, Jr. and Tom heading up the operation under the Sr. Mr. White's guidance, the company prospered. Their work gradually was extended to include bridges, foundation preparation, pile driving, dredging and buildings such as schools and warehouses.

In 1960, the J. F. White Contracting had completed \$10 million of construction. This included both private and public work, the latter coming from federal, state and municipal contracts.

Integrity and know-how key to success

The White brothers feel that the integrity and loyalty of key employees has sparked the company's rapid ad-



***EARTHMOVING** Part of J. F. White's fleet of scrapers and tractors shown moving earth on road building project.

CONSTRUCTION...*

Contracting Co. to \$10 million a year!

vance. In 1946, for example, the company had only four people as contrasted with 40 permanent staff members and 450 workers today. From a few units valued at less than \$100,000, White's equipment inventory has grown steadily to more than 275 units valued at \$4,000,000. And during this period of success and growth, this contractor's diversified work was extended from the confines of Massachusetts to New Hampshire, Connecticut, Rhode Island and Maine. In the 5-year period through 1960, White completed \$30,000,000 of work in New England.

Management team of young, progressive men

The J. F. White Contracting Company is basically an organization of young, dedicated construction men. This company's management team is headed by Joseph F. White, Jr., President; Thomas J. White, Treasurer and General Manager; Richard V. McDermott, Vice Pres. and Gen. Supt.; John S. Davagian, V.P. Chief Engr.; Louis J. Luccio, V.P. Drainage Engineer; George Montague, V.P. Chief Accountant. Under the management and direction of these men the company has increased its construction volume through diversification and enterprise. During this period of expansion, the company's equipment inventory also grew. (A detailed breakdown of White's equipment is shown at the left.)

Operates subsidiary companies for construction needs

Indicative of the progressive ventures and growth of the J. F. White Contracting Company are its development of subsidiary companies which are geared to the parent company's needs. These subsidiaries include Hard Rock, Inc., which is restricted to drilling and blasting for the parent company and also sub-contract work; Blakeslee-Rollins Co., Inc. which is devoted to port and harbor improvement, dredging, and piers; Southeastern Stone Co. which embraces 3 asphalt plants and two stone quarries which produce bituminous concrete. The asphalt plants produce some 300,000 tons a year. All of the subsidiary companies are designed to perform a specific job or to expedite White's operations in scattered locales.

\$1,500,000 of equipment purchased in 2 years

The diversification of this contractor's work and the

extension of its construction operations into states other than Massachusetts has necessitated the purchase of increased units of equipment. The company is constantly looking for new and improved equipment for replacement and expansion. In 1959, \$1 million was spent on different types of equipment and in 1960 another \$500,000 was purchased.

\$250,000 a year invested in maintenance

To keep some \$4 million worth of construction machinery in top running condition, White invests a quarter of a million dollars annually on their maintenance operation. They also purchase 1,200,000 gallons of diesel fuel. Two buildings and 25 men are employed to perform the necessary repair and maintenance work. The use of 19 two-way radios helps speed up on-the-job maintenance.

Key men influence purchasing at White

Like most contractors of J. F. White's size, this contractor's purchasing policies and decisions are the result of careful planning coupled with the know-how and experience of many men in key positions.

Joseph F. White, Jr., president, says:

"The purchase of construction equipment for replacement and expansion is most important to us. Before we make any decision to purchase, we have a meeting of our key personnel, Master Mechanics, vice presidents, superintendents, the secretary-treasurer and myself attend. We always check our key personnel for their opinions on the performance and usefulness of different types and brands of equipment. These opinions are seriously considered and enter into our final buying decisions."

The success of America's important contracting firms like the J. F. White Contracting Company can be traced to the knowledge and application of latest techniques, equipment and materials. In addition to the key men in the J. F. White Contracting Company, **CONSTRUCTION METHODS** serves the needs of key men in over 15,200 contracting firms across the nation in every type of heavy engineered construction.

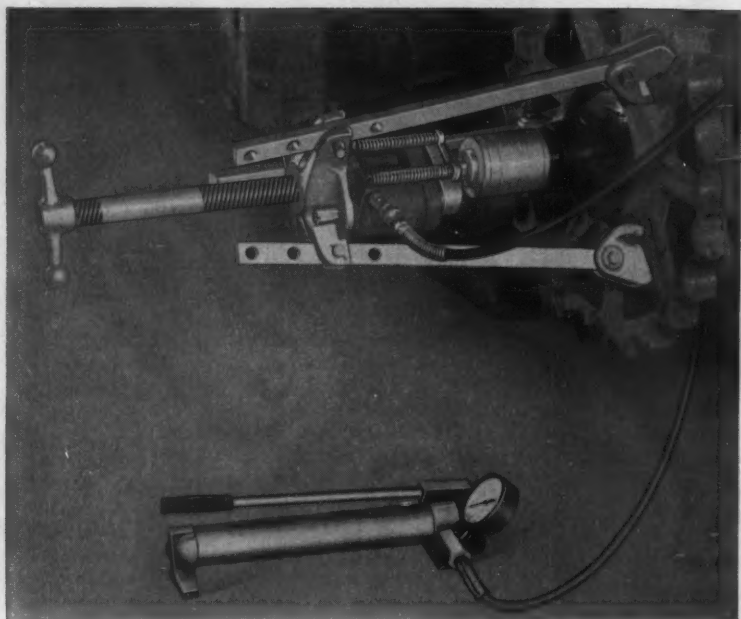


***PAVING** Road construction and paving is one of White's most important construction activities. Paving shown above.



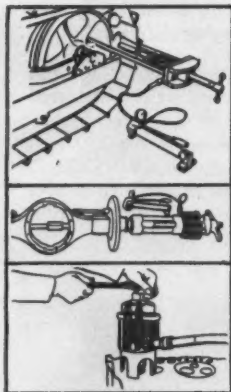
***BRIDGE AND MARINE** \$3 million bridge and underpass project, Cambridge, Mass. Required prestressed concrete beams and concrete decking.





One man pulls sprocket in minutes... on-the-job...with OTC puller-installer

One man, in minutes can pull or install a tractor sprocket on-the-job with an OTC hydraulic puller-installer set. Saves hours, even days, of costly down-time. Special pullers with up to 100 tons of hydraulic power are designed in co-operation with major tractor manufacturers to do all types of maintenance jobs—fast—without damage to parts. One basic hydraulic unit with special attachments will handle a variety of tractors.



VERSATILE RAM AND PUMP AVAILABLE FOR MANY OTHER JOBS

Track Master Pin being removed with same Power-Twin ram and pump plus accessories. Pin is removed—installed in minutes. Hand, electric or gas driven pumps available.

Truck Axle Tube being removed with OTC Hydraulic unit and accessories. Same unit installs tube—fast—without distortion.

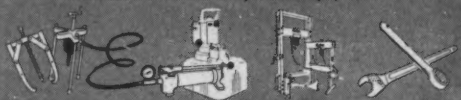
Valve Seat Insert being pulled with 17½-ton Power-Twin ram and pump. Takes little effort and does not damage cylinder head. Three sizes fit most engines.

See your OTC Distributor or write—

OWATONNA TOOL COMPANY

380 CEDAR ST., OWATONNA, MINNESOTA

Designs and manufacturers of the world's most complete line of Maintenance Tools and Hydraulic Equipment.

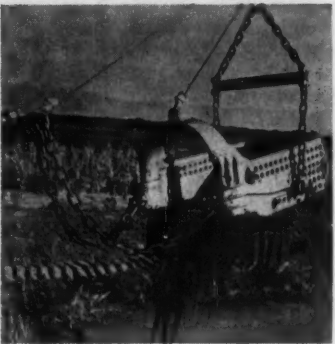


PULLERS AND PULLER SETS - HYDRAULIC RAMS AND PUMPS - HYDRAULIC SHOP PRESS - HAND TOOLS

JOB TALK . . .

continued from page 28

top and bottom wales were tied back to a 12-in.-dia treated-timber deadman by 16-ft-long rods at 5-ft centers. Backfilling behind the bulkhead completed the job.



Rigs Rip Roots

A contractor at work on a Bureau of Reclamation project in New Mexico has developed a couple of useful attachments for clearing irrigation ditches.

One of the devices is a brush cutter mounted on a Cat D7 crawler tractor. In operation, a cutting edge at the bottom moves underground at root level while a bar at the top pushes over brush.

The other attachment is a drag-line bucket fitted with teeth that comb brush from the slopes of irrigation channels. A 500-lb weight placed behind the pivot point keeps the bucket from filling. The Or-Bet Corp. devised both rigs.

The contractor is clearing vegetation and cleaning and reshaping 8 mi of existing irrigation ditches along the New Belen Acequia in New Mexico. The contractor also will replace several abandoned buildings with new structures.

Want to make sure of your profits
and save valuable construction time?

New steels are
born at
Armco



Armco Construction Service crew installs Armco MULTI-PLATE® Pipe conveyor housing in California.

For Strength
Durability
Economy



Buy Armco Products Installed!

There's no need to gamble with profits or costly deadlines. By purchasing your Armco Products for engineering and construction on an installed basis, you know costs in advance and don't worry about inexperienced crews handling specialized jobs. This service is available to general contractors on a fixed-price subcontract.

Armco Construction Service, for the past 30 years, has provided skilled crews and equipment to handle specialized jobs quickly and economically. Send coupon for details on this service. Armco Drainage & Metal Products, Inc., 4111 Curtis Street, Middletown, Ohio.

Send coupon for this FREE book

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Middletown, Ohio

Name

Firm

Street

City State



ARMCO Drainage & Metal Products

Circle 33 on Reader Service Card



J. P. Neill strings 60-inch pipe over with never a breakdown...

Talk about tough pipe jobs! The J. P. Neill Company, Inc., as sub-contractor under Morrison-Knudsen Co., Inc., is shown laying a 60-inch water pipeline through hard rock and open pit coal mines, across two rivers, up and down mountainous slopes. So far, the Dallas, Texas, contractor has moved at a steady clip—1,000 feet a day.

When completed, the new line will provide 75 million gallons of water daily for the city of Birming-

ham, Alabama. It will easily meet the urgent needs of industrial and domestic users.

Before the project started, Gulf engineers helped the contractor establish an effective maintenance program based on clean-working Gulf lubricants and clean-burning Gulf fuels. These products include: Gulflube® Motor Oil H.D., Gulf Super Duty Motor Oil, Gulf Diesel Fuel, Good Gulf® Gasoline, and Gulf Multi-Purpose Gear Lubricants.



Gulf lubricants and fuels help keep equipment delivering top performance as it wrestles 20,000-pound pipe sections over tough terrain.



Olan Jones, right, Superintendent, and Ed Johns, Gulf Sales Engineer, watch closely as a pipe-layer swings into position. No delays have been attributable to fuels or lubricants.

33-mile obstacle course GULF MAKES THINGS RUN BETTER!

What about results? Olan Jones, Supt., answers: "Our pipe-laying tractors, trucks and welders operate 10 hours a day. They've all given top performance. Not one delay is attributable to lubricants or fuels."

Try Gulf fuels and lubricants on your next project. You'll soon see how Gulf makes things run better! Contact your nearest Gulf office for a quotation. For helpful maintenance tips, and information on Gulf products, write for 88-page "Contractors' Guide."

GULF OIL CORPORATION
Dept. DM, Gulf Building
Houston 2, Texas



Save Time . . . Cut Concrete Forming Costs

Be Sure of Results with

DAYTON SURE-GRIP Accessories

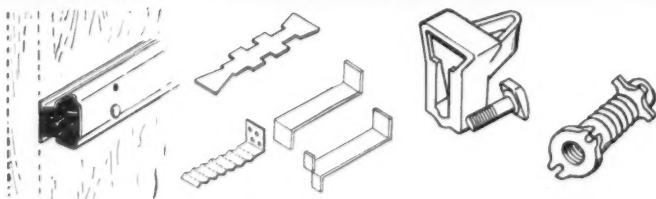
Concrete forming costs going up? Dayton Sure-Grip can help you bring them down with a combination of technical service, a complete line of accessories of dependable quality—established by 37 years of manufacture—and the efficient on-the-spot service of a nearby DSG Distributor.

The DSG line is complete—from ties for either conventional or factory-built forms to anchors for heaviest precast work. This one source of supply saves your time in ordering, checking, receiving, use.

Dependable DSG accessories provide safe, fast, reliable forming . . . extra strength without premium cost.

There's a Dayton Sure-Grip Distributor ready to serve you. He's experienced and reliable . . . capable of helping you solve your forming problems.

Cut your forming costs. Let Dayton Sure-Grip service help you eliminate mistakes in planning, procurement and form production. . . . Have the reliable accessories you want, when you want them. Write today for our free catalog and prices.



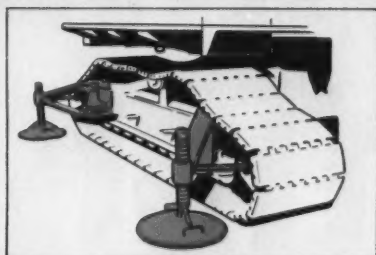
THE DAYTON SURE-GRIP & SHORE COMPANY

113 KERCHER ST., MIAMISBURG, OHIO

◀ Circle 35 on Reader Service Card

Circle 36 on Reader Service Card

SAVE \$\$\$ THOUSANDS!



Outriggers pivot into place. You get a big, square, firm foundation for lifts to 90,000 lbs. With outriggers tucked away, you can lift and walk with loads over 40 tons!

KOEHRING 545 SPRAWLER LIFTS AS MUCH AS OTHER MACHINES COSTING UP TO \$20,000 MORE

The Koehring 545 Sprawler lifts an amazing 90,000 pounds. And it actually costs \$20,000 less than 2 and 2½-yd. machines in the same range of lift capacity.

Don't raise an eyebrow. It's a fact. Your Koehring distributor can prove it and will welcome the opportunity to show you these figures in detail.

Another astonishing fact — Sprawler, is smaller in size. Moves

from job to job faster, easier . . . takes less time to ready for work and travel.

From the ground up, Sprawler is truly something special. Its unique one-piece carbody, long, wide crawlers, and pivoting outriggers resist torsional strains at every working angle . . . enable Sprawler to outlift its own working weight by 14%!!

See your distributor about the

545 Sprawler . . . and the companion 330 Sprawler that gives you comparable cost-saving features. See him today!

K104

**KOEHRING MEANS
HEAVY DUTY**

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

Why does CEDARAPIDS give you FASTER—

Because Cedarapids has applied the principle of *high frequency vibration*—proved so effective in soil compaction—to the design of Cedarapids Bituminous Pavers.

Here's how the patented vibrating screed, exclusive on the Cedarapids Paver helps you lay denser, smoother, more uniform bituminous mat *with greater profit to you.*

With the high frequency vibration of the screed (3600 impulses per minute) you can work at speeds up to 102 fpm and obtain equal—or greater—density than with conventional pavers working at slower speeds. This means more miles paved per day with no increase in operating or labor costs.

A Cedarapids-laid mat requires less rolling. The vibratory impacts of the screed are more intensely registered throughout the entire thickness of the mat than is possible with the ordinary tamping bar. Result—air bubbles are immediately

dissipated by the high frequency vibration. Less rolling of this denser mat means time and money saved for you.

The same high frequency vibration of the Cedarapids screed permits it to move more rapidly over the hot plastic surface of the asphaltic concrete. An ordinary sliding screed, with a stroking cut-off bar ahead of it, tends to cause tears and voids in the surface when working at comparable speeds. The Cedarapids vibrating screed *irons* the mat into a smooth, perfect surface.

To this high frequency vibration, the Cedarapids Paver design adds many advanced engineering features... low operating and maintenance costs, less downtime, easy push-button operation, to name a few. These are among the Cedarapids Paver benefits that have been *job-proved in the field for over four years.* No wonder this machine is so popular with profit-minded contractors all over the country.

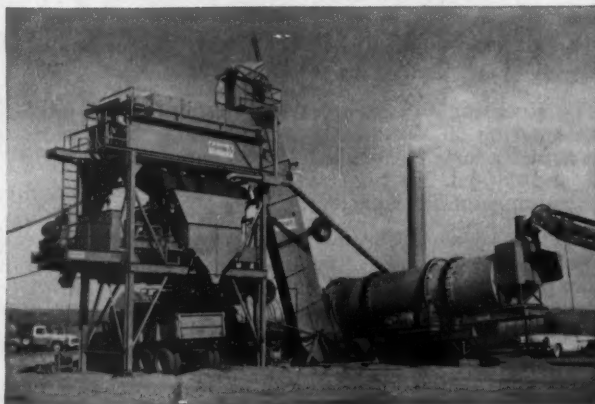
Take advantage of the profit potential that's exclusively yours with

CEDARAPIDS HIGH FREQUENCY

VIBRATION

CUT YOUR OVER-ALL JOB COSTS WITH A CEDARAPIDS "PAVING PACKAGE"

A Cedarapids Bituminous Mixing Plant is the profitable complement to your Cedarapids Paver to give you a complete, money-saving "Paving Package." There's a wide range of sizes and types in the Cedarapids line to meet your exact needs. The big G60A portable batch-type plant (right) or the H60A stack-up batch plant deliver up to 300 tons per hour for high capacity jobs. Sizes range down to the 1500-lb. Model H15 for producing specification mix in whatever volume you need.



BETTER — LOWER COST BITUMINOUS PAVING?



Cedarapids
Built by
IOWA

IOWA MANUFACTURING COMPANY

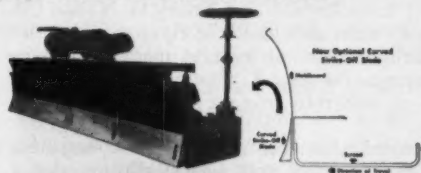
Cedar Rapids, Iowa

52A14

MORE CEDARAPIDS PAVER FEATURES YOU'LL LIKE

Curved Strike-Off Blade

Imparts a rolling action to bituminous material that feeds it back to the spreading screws. Curved blade also imparts an aggressive action which breaks up lumps and meters the proper amount of material to screed.

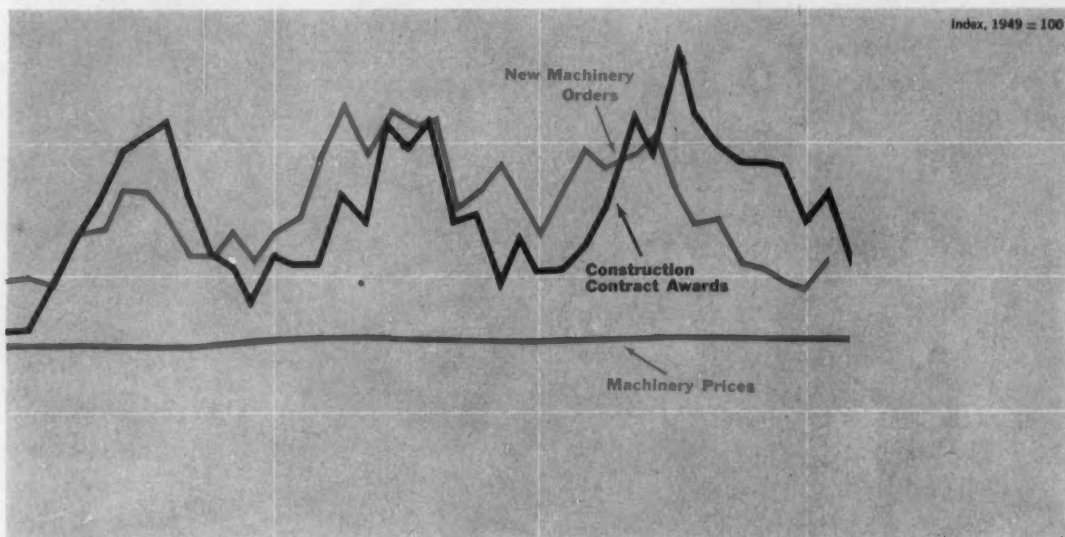


Oscillating Track Rollers

A Cedarapids exclusive! Track rollers are mounted on rocker arms to allow them to ride across uneven bases while the screed remains on an even plane. Finished pavement is not affected.



Trends in the Machinery Market...



Price Index

	FEB. 1961	MONTH AGO	YEAR AGO	% CHANGE 1960-1961
All Types of Equipment	177.8	177.6*	173.9	+ 2.2
Cranes; Draglines, Shovels	172.9	172.9	171.9	+ 0.5
Shovel, 1/2 cu yd	170.9	169.3	166.2	+ 2.8
Shovel, 3/4 cu yd	176.6	175.4	174.7	+ 1.1
Shovel, 1-1/2 cu yd	189.3	189.3	187.0	+ 1.2
Shovel, 2-2 1/2 cu yd	169.1	169.1	166.4	+ 1.6
Shovel, 3-3 1/2 cu yd	159.8	159.8	167.8	- 4.8
Shovel, 6 cu yd	197.9	197.9	195.0	+ 1.5
Crane, truck mounted	166.0	168.2	168.2	- 1.4
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	162.9	162.9	157.5	+ 3.4
Bucket, dragline	169.3	169.3	169.3	0
Scrapers and Graders	166.6	166.6	165.8	+ 0.5
Scraper, 4 wheel, 8-10.5 cu yd	155.0	155.0	155.0	0
Scraper, 4 wheel 12-15 cu yd	156.8	156.8	156.8	0
Scraper, 2 wheel, 15-19.5 cu yd (a)	126.2	126.2	124.9	+ 1.0
Grader, heavy duty	174.1	174.1	172.6	+ 0.9
Grader, light & medium	170.9	170.9	171.1	- 0.1
Tractors (non-farm, incl industrial)	195.4	195.4*	189.9	+ 2.9
Wheel type, off-highway (a)	129.2	129.2	129.0	+ 0.2
Crawler type, 50-74 dph	205.3	205.3	195.8	+ 4.9
75-99 dph	204.3	204.3	190.2	+ 2.0
100-154 dph	199.2	199.2	192.4	+ 3.5
155-200 dph	208.6	208.6	203.3	+ 2.6
Machinery, Tractor Mounted	176.7	176.7	169.0	+ 4.6
Dozer, cable controlled	164.8	164.8	154.4	+ 6.7
Dozer, hydraulic controlled	201.9	201.9	186.6	+ 8.2
Cable power control unit	152.9	152.9	151.4	+ 1.0
Loader, tractor shovel	164.6	164.6	162.5	+ 1.3
Specialized Machinery	159.1	159.3	158.0	+ 0.7
Ditcher	153.8	153.8	150.1	+ 2.5
Roller, tandem	230.3	230.3	231.0	- 0.4
Roller, 3 wheel	178.7	178.7	178.7	0
Ripper and rooter	164.5	164.5	150.5	+ 9.3
Dewatering pump, 10 M gph	110.3	111.5	110.3	0
Dewatering pump, 90 M gph	152.1	151.5	151.5	+ 0.4
Portable Air Compressors	180.9	173.1*	167.5	+ 8.0
Contractor's Air Tools	190.6	190.6*	181.6	+ 4.9
Mixers, Pavers, Spreaders	160.1	160.1*	158.6	+ 0.9
Mixer, portable, 11 cu ft	168.2	166.6	166.8	+ 0.8
Mixer, portable, 16 cu ft	172.9	172.7	172.7	+ 0.1
Mixer, truck, 6 cu yd	133.2	131.9	132.7	+ 0.4
Mixer, paving, 34 cu ft	192.9	192.9*	193.5	- 0.4
Concrete finisher & spreader	196.7	196.7*	199.7	- 1.6
Bituminous distributor	126.2	126.2	126.2	0
Bituminous spreader	179.4	179.4	170.2	+ 5.4
Bituminous paver	165.6	165.6	163.2	+ 1.5
Off-Highway Trucks, Wagons (b)	102.5	102.5	101.1	+ 1.4
Contractors off-highway truck (b)	102.0	102.0	101.1	+ 0.9
Trailer dump wagon (b)	106.7	106.7	101.4	+ 5.2

* (a) January, 1955 = 100 * (b) January, 1958 = 100 * Revised
BLS Primary Market Price Indexes, U. S. Department of Labor, 1947-49 = 100

Equipment Sales Are Spotty But Contract Totals Are Up

NEW ORDERS for construction and mining machines in January were the lowest for the month since 1958. They fell 16% under a year ago and were 8% off January '59, the McGraw-Hill Economics Dept. index shows.

A CM&E check of a number of manufacturers, however, reveals that the sales trend was mixed early this year.

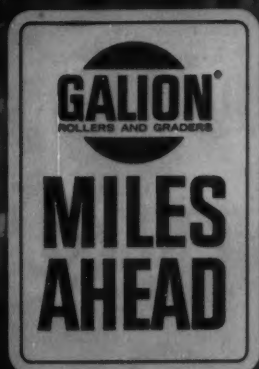
Sharply increased sales in January were reported by Barber-Greene, Chain Belt and Clark Equipment.

Barber-Greene's January sales were up 30% over a year ago and 55% higher than in January 1959. February's gains were even more remarkable, the company noted, and overseas sales of foreign plants were particularly strong.

Chain Belt in January had its biggest sales month since December '58. Clark Equipment's Construction Machinery Div. racked up a 15% jump over January '60 and a new January sales record. But the month is traditionally the low point of the year and first quarter sales are expected to just about match a year ago, a Clark spokesman says. Prices of most Clark construction equipment went up 5% on February 13; some items went up 4%.

Slight increases over January '60 were turned in by Cleveland Trencher Co. and Frank G. Hough Co. A Hough spokesman said that the company is making price "adjustments" on certain models, but expects no across-the-board change. Worthington Corp. sales of concrete mixing equipment topped January '60.

Heavy construction contractors' new business slacked off in February and was slightly under a year ago. But the large January total held the two-month volume at 13% above '60.



You'll stay ahead when the "Chief" leads the way!

Extra surface rolled every hour—that's one of the proved advantages when you operate the Galion "Chief" pictured above. Size for size it gets more done—faster—than other rollers of its type.

Its rugged design increases your rolling efficiency tremendously. Power-to-spare engine, hydraulic steering, fingertip control and Roll-O-Matic Drive result in better compaction with a smoother surface.

Take Roll-O-Matic Drive, for example, which applies power automatically. This one Galion feature alone promises at least 10% more surface rolled in any given time, under any terrain conditions, up grades or down.

For complete information contact your Galion distributor or write for Bulletin 410-A.



RENT A ROLLER
Ask your Galion distributor
about our cost-cutting
Rent-A-Roller Plan.

THE GALION IRON WORKS & MFG. COMPANY, GALION, OHIO, U.S.A.
General and Export Offices, Galion, Ohio, U.S.A.—Cable Address, GALIONIRON, Galion, Ohio

YOUR NIGHTMARE IS OVER

EVERYTHING IN ONE OPERATION MINUTE HAND

RECORD

RECORD TOWER CRANES

Free-travelling up to 220 feet!
 Static inside construction up to 360 feet!
 Climbing over 1000 feet....!
 Self-erecting...
 Patented telescopic action (hydraulic)
 Entirely remote-controlled...!
 46 different types available..
 Over 2600 produced per year.!

YOUR:

- Concrete
- Reinforcement
- Shuttering
- Bricks & blocks
- Stones & claddings
- Pre-cast beams
- columns
- walls
- floors
- lintels
- Steel joists
- girders
- The lot..!

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Fully illustrated technical catalogue available on request

Circle 42 on Reader Service Card

CONSTRUCTION METHODS



How many "machines" is a MODERN LOADER?

JOB-PROVE the 4-in-1 and see...

Here's what the 5 Four-in-One's, shown, are doing: (1) (Left foreground) The 3-cu. yd. TD-20 rig is 'dozing'; (2) (Right foreground) The ¾-cu. yd. T-340 outfit as "carry-type scraper;" (3) (Right center) The 1½-yd. TD-6 4-in-1 "semi-skids" load on its skid shoes; (4) (Center): This 2¼-cu. yd. TD-15 "biting bucket" clam-handles a stump; (5) (Rear) TD-9 rig is back-dragging gravel!

It's a whole equipment spread of job-getting actions, if it's "the bucket with the bite"—an exclusive clam-action International Drott 4-in-1.

"Dragonized" to dramatize "the bucket with the bite," the five 4-in-1 sizes above demonstrate *plus* actions you get with the exclusive clamshell.

Full-capacity, full-range, depth-controlled bulldozer performance. "Carry-type scraper" action to grade, strip, or spread with inch-close accuracy. Skid-Shovel action to "semi-skid" full buckets of material. Controlled back-dragging clam-action, to grade, pick up, or pull down materials. "Clamming-on" action to grab and load heavy unwieldy "impossibles."

Note also the 4-in-1 gives you the top excavator-loader performance on the market! That includes certified break-out forces ranging from 11,200 lbs. with the T-340, to 43,150 lbs. with the TD-20. And only the 4-in-1 gives you clam-type bottom dumping—that ends sticky materials loading problems, for good!

See for yourself how many "machines" the only modern loader is! Move the 4-in-1 machine-action selector lever. Prove you get a whole spread of money-making actions, that obsolete "single-action" loaders, and double for a yard-full of limited-duty rigs! See your International Drott Distributor for a 4-in-1 demonstration.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



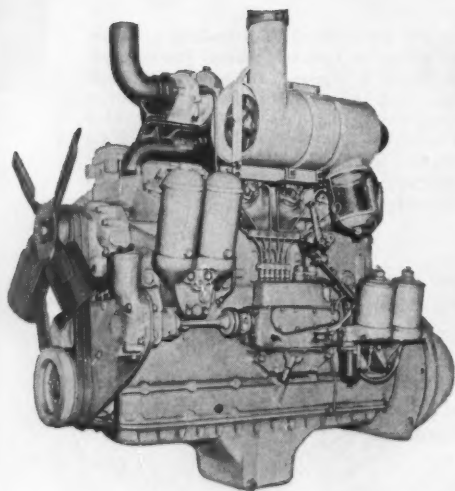
INTERNATIONAL
DROTT

NEW International TD —

**...built to "BEEF UP"
your profit edge!**

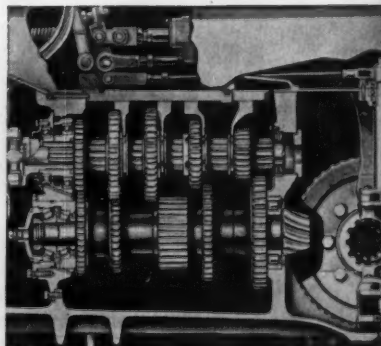
From air intake to new fixed drawbar —from day-to-day dependability through year-in, year-out durability—new strength, new performance protection, new work capacity are built into the new TD-20. Check and compare the advantages of International turbocharged Diesel power, teamed with beefed-to-match new transmission and final drive

components—platformed on a far stronger-than-ever undercarriage — turned into new efficiency by International-built tracks, kept in life-prolonging alignment by exclusive International 3-point suspension. See your International Construction Equipment Distributor for a new TD-20 demonstration.



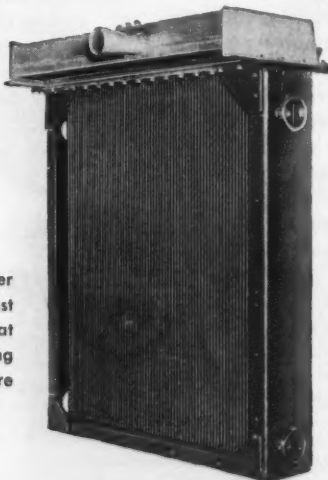
New Turbocharged Diesel Wallop

Modern turbocharging crams air into the new TD-20's smooth running 6-cylinder engine—to produce extra hp efficiently at all altitudes; and to give a 50% torque rise to lug larger overloads. Crankcase ribs are "beefed up;" cooling, air cleaning, and crankshaft capacity all are increased to team with turbocharging. Push-button TD-20 starting is by famous International gasoline-conversion system!



Larger radiator plus jet head increases cooling capacity

Coolant, under pressure from the new greater capacity radiator, is shot through jets against lower surface of TD-20 heads—to aid heat transfer and avoid build-up of heat-trapping deposits. Fan shroud and radiator guard are "heaved" for increased rigidity.



New transmission capacity ...New filtering system added

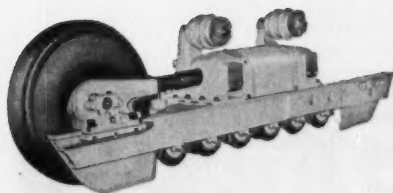
Heavier shafts, more rugged gears, and roller bearings of greater capacity are provided—to carry increased hp and add thousands of hours to working life of power train components. New transmission oil pump circulates and filters life-guarding lubricant. New "short-travel" levers add operating ease.

20

(201 SERIES)

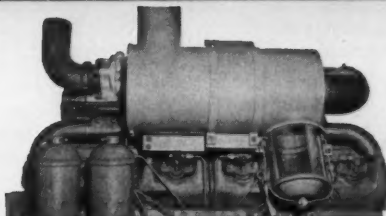


New 140-hp International TD-20 crawler tractor. Develops 113 drawbar hp. Powered by 6-cylinder DT-691 Turbocharged Diesel engine. New capacity 6-speed, full-reverse transmission is controlled by new short-travel gear-shift and Shuttle-Bar levers.



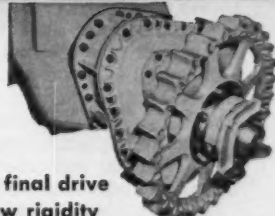
New Undercarriage Strength and Protection

New drum-type front idlers add strength... International also adds track chain guides to both sides of the TD-20's precision-welded double box-beam track frames! New track roller shields are of cast steel. New heavier strutless track links are self-cleaning and power-saving. The new hydraulic track adjuster, with built-in safety relief is "standard" on the new TD-20. And full-floating seals of increased efficiency guard Dura-Roller life!



New 99.8% efficient Dry-Type air cleaner

For positive "breathing" safety, the full air volume taken in by turbocharging is "dry-cleaned" of 99.8% of its dirt—by the TD-20 Diesel's new dry-type air cleaner. Handy, under-hood horizontal mounting—and transparent, quick-dump collector—greatly simplify servicing. Dosh indicator shows "red" when cleaner element needs washing.



New final drive ...new rigidity

New TD-20 final drives have been strengthened to deliver full torque turbocharged power to the tracks. New sprocket drive doweling increases housing rigidity—helps maintain precision component alignment. Other major steps ahead in TD-20 design include: new torque-taking, life-adding bimetallic steering clutch discs; new pivot shaft inner spacer; new hardness of sprocket drive pinion shaft.



**International
Construction
Equipment**

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

MANITOWOC 4500 VICON*

the only really new excavator design since steam!



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Σ

The Maniowoc Model 4500 VICON represents the most outstanding advancement of excavator design in decades. Here is a 6 yard shovel or 7 yard dragline incorporating new, tested design principles to give you more yardage in less time than any other mechanical or electrically driven shovel-drag in this size range. Thoroughly proved on the job for over three years, VICON design has increased yardage 25% or better, substantially reduced maintenance costs, and piled up more profits for owners. Some exclusive VICON features are:

INTEGRATED CONTROLS that serve both as clutch operating levers and as engine throttles, providing variable speed control over each function. Clutches, being responsive to lower range of control pressures, are engaged before engines are accelerated. Slippage and overheated friction surfaces are eliminated, lengthening clutch life appreciably.

HOIST AND DRAG DRUMS ARE INTERLOCKED to automatically synchronize their operation. Cycle time is faster and output is greater because full horsepower is always available for hoist—the operator doesn't "soak" it up with the drag brakes. Operating costs are noticeably less because brake use is cut by 50%

and lining wear is drastically reduced. Another advantage of the VICON interlocked drum arrangement is that the operator can "power lower" or free-cast the bucket.

DUAL INDEPENDENT ENGINE POWER with one engine powering the main drums, and the second all other functions. Here are all the advantages of electric or conventional diesel engine mechanical drive without the disadvantages of each. You get the performance characteristics of electric drive — smoother power flow, variable independent speed control, simultaneous operation of dig, hoist, swing, and propel functions—without sacrificing mobility, without incurring the headaches and special maintenance problems of electric drive, without needing a separate power source at every job site. You get the simplicity of mechanical drive without losing valuable production time because of engine "lug down", without needing to jam clutches into engagement at high and harmful engine speeds, without the limitations of operating speeds that are inherent in conventional diesel engine drive.

Why not get the complete story on the *sensational* Model 4500 VICON today? Your nearby Maniowoc distributor has all the facts.

8-A * Variable Independent Control

Maniowoc

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Maniowoc Company, Inc.)
Maniowoc, Wisconsin

SHOVELS
1½ — 6 YDS.

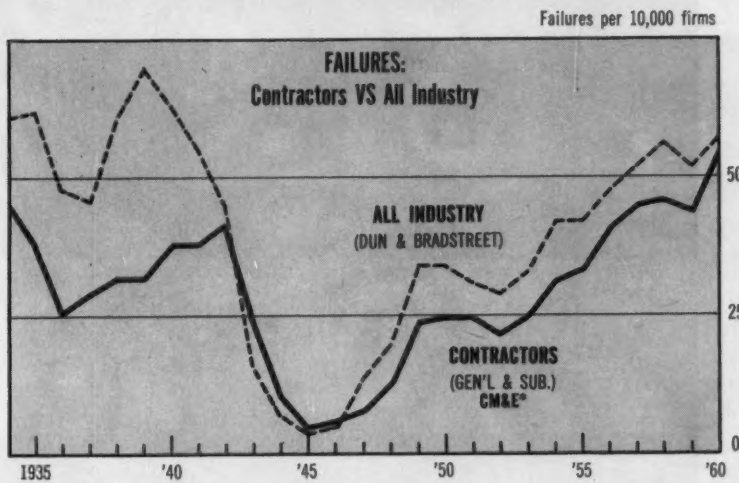
CRANES
25 — 125 TONS

DRAGLINES
1½ — 7 YDS.

TRENCH HOES
1½ — 3 YDS.

Circle 46 on Reader Service Card

Construction Business...



*Combined by CM&E from DUN & BRADSTREET and COMMERCE DEPT. data.

Contractor Failures Rise as Profits Shrink

SLIM PROFIT MARGINS continue to make construction a risky business. Although contractor bankruptcies remain a small proportion of the total number of contractors and subcontractors in operation, the rate of failure is rising at a fast clip.

For every 10,000 contractors and subs in operation at the start of last year, 55 were reported bankrupt by Dun & Bradstreet at the end of the year. This is the highest mortality rate since Dun & Bradstreet began to keep track of contractor failures in 1934. Last year's failure rate compares with 1959's rate of 44 per 10,000 and exceeds 1958's previous all-time high of 46 failures per 10,000.

In the first two months of 1961, the trend toward more failures was continued. The two-month count of contractor bankruptcies was 24% higher than for the same period last year and an added danger sign is the fact that liabilities are up, too.

The chief force pushing the failure total up is the decline of profit margins. The table on page 48 shows what's happened to contractor profit margins and those

of related industries in the 1951-59 period (Dun & Bradstreet's 1960 contractor data will not be ready until December).

Price competition among contractors, which reflects the rapid growth of contracting capacity compared with the availability of new work, is readily apparent from these figures:

- Profits on net worth of large building contractors dropped from a median of 11.1% in 1956 to a 5-yr low of 7.66% in 1959.
- Electrical contractors suffered an even sharper cut—from a median of 17.7% in 1957 to 5.88% in 1959.
- Hardest hit were structural steel fabricators, whose median profits on net worth fell to a mere 4.82% in 1959—less than one-third of the comfortable margin they had during the record 1957 industrial building boom.

These "median" percentages represent the mid-point of profits of the individual companies included in Dun & Bradstreet's analysis. Half of the companies had greater profit margins, and the other half had lower ones. Com-

panies surveyed by Dun & Bradstreet are among the largest contractors in the business. Over the years, the list remains almost the same, with only a few new companies being added. The "building" contractor category includes few, if any, homebuilders.

Contrasting with the profit picture for contractors are the improved profit margins of wholesalers and retailers in the lumber, building materials, and heating and plumbing equipment lines. They apparently benefited from the 1958-59 rebound in the home-building market.

Despite the rapid rise in contractor failures, the industry isn't doing much worse than American business as a whole. The chart on this page shows that the rate of increase of contractor failures during the past 13 yr has been about the same as the all-industry trend.

But 1960 was an exception; contractor failures rose much faster than total business failures.

This year, the sharp increase in contractor bankruptcies is not much greater than for business as a whole. And there are reasons to look for a slight improvement in profit margins and, perhaps, for a slowdown in the rate at which contractors are going to the wall.

New business, especially for heavy construction contractors, is on the rise for the third consecutive year and costs are more stable. These basic ingredients of the cost-price squeeze seem to be losing a little of their punch. Also, competition in the second half of last year appeared to ease up just enough to allow a slight rise in contractor selling prices. These factors were not enough to save profit margins from dropping in 1960, but they indicate that 1961 profits may have an opportunity to rise slightly.

These indicators are worth watching:

- Bid prices on federal-aid highway jobs in the second half of 1960 were higher than the first half. But the fourth-quarter figures partially reversed the third-quarter rebound and left

POKER? Play to win!



How would you play this hand?

Odds are 50-50 you're high hand before the draw. Open, or if you're to left of opener, raise. Don't stay on less, though. Queens or under most times are drawing against a better hand.

Here's a sure winner from FORD:

Two new Ford Tractors built for half-yard loading, for 10 ft. or 12 ft. digging!

New 4000 Series Industrial Tractor for work demanding up to 42 drawbar horsepower; new 2000 Series for work requiring up to 32 drawbar horsepower.

Gasoline or diesel, choice of transmissions, job-matched with dozens of front, side and rear attachments.

Get details from your Ford Tractor Dealer, or write:

Tractor and Implement Division
Ford Motor Company
Birmingham, Michigan



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CONSTRUCTION BUSINESS . . . continued

Profits Drop for Contractors. Climb for Suppliers

MEDIAN profit percentages compiled by Dun & Bradstreet, New York

		Contractors Build- ing %	Elec- trical %	Steel Fabi- cators %	Wholesalers Lumber & Building Material %	Plumb- & Heat %	Retailers Lumber & Building Material %
NET	1959	7.66	5.88	4.82	5.10	6.97	4.54
PROFIT	1958	9.48	9.28	8.92	5.10	4.02	4.01
ON	1957	10.68	17.70	14.93	3.46	3.86	4.80
TANGIBLE	1956	11.10	9.63	12.54	8.22	9.85	6.01
NET	1955	8.80	9.37	11.83	7.34	8.55	5.50
WORTH	1954	7.39	6.19	10.08	6.53	5.71	6.92
	1953	11.92	13.89	11.89	7.14	6.86	4.94
	1952	9.63	14.96	12.54	5.54	8.19	6.98
	1951	11.54	14.62	15.82	12.04	11.86	8.29
NET	1959	12.45	10.44	8.47	8.15	7.83	6.25
PROFIT	1958	16.71	10.47	12.94	6.31	4.61	5.42
ON	1957	17.33	22.99	25.90	4.57	4.43	6.26
WORKING	1956	15.18	13.80	20.24	9.97	10.72	8.28
CAPITAL	1955	13.83	12.54	19.30	10.26	10.61	7.85
	1954	11.76	9.43	17.89	8.66	7.55	8.59
	1953	19.21	17.24	18.59	9.29	8.20	7.07
	1952	12.20	20.45	20.89	6.63	9.34	9.24
	1951	18.54	17.33	25.62	15.28	13.85	10.91
NET	1959	1.33	1.17	1.63	1.35	1.72	1.92
PROFIT	1958	1.46	1.94	3.72	1.24	1.06	1.65
ON	1957	1.56	3.69	3.84	1.30	1.09	1.66
NET	1956	1.61	2.07	3.99	2.15	2.08	1.88
SALES	1955	1.52	1.73	3.39	1.54	1.88	1.65
	1954	1.29	2.21	2.52	1.60	1.60	1.98
	1953	2.05	3.09	3.14	1.89	1.65	1.57
	1952	1.30	3.39	4.02	1.21	1.71	2.60
	1951	1.82	3.13	5.07	2.78	2.76	2.79
NUMBER	1959	158	49	84	100	179	158
OF	1958	168	49	96	104	161	142
COMPANIES	1957	179	51	101	87	156	130
COVERED	1956	145	55	103	90	140	130
	1955	133	42	74	85	138	128
	1954	123	47	76	83	136	132
	1953	122	45	65	74	125	136
	1952	130	43	59	77	127	139
	1951	177	48	53	76	173	132

*Structural steel fabricators

the BPR index 2% under its late 1959 level.

● Irrigation and hydro power construction costs in 18 western states moved up in January, the second rise since mid-1960.

● Contract unit prices for heavy construction in the west held onto the rises posted in the first half of 1960 and remained steady in the second half, according to the index compiled by the Corps of Engineers.

● Of the five major building contractor selling price indexes, three moved up in the six months ending December '60 or January '61, and two held steady.

From these indicators, it appears that contractors are passing on to customers at least some of the latest rises in basic costs. But no one knows whether 1961 prices can advance enough to cover cost hikes and still leave room for at least a slight improvement in profit margins.

SOME BIG CONTRACT AWARDS OF THE MONTH

F. E. Young Construction Co., San Diego, Calif. Construct jail building in Los Angeles. Los Angeles County Board of Supervisors. \$13,630,000.

Doyle & Russell, Richmond, Va. Construct office building in Richmond. Virginia State Highway Dept., Richmond. \$3,874,444.

McNamara Quebec, Inc., Montreal, Que., Canada. Build iron ore terminal at Pointe Noire, Que. Dominion Dock Co., a subsidiary of Wabush Iron Co., Ltd., Montreal. Total cost is \$12 million.

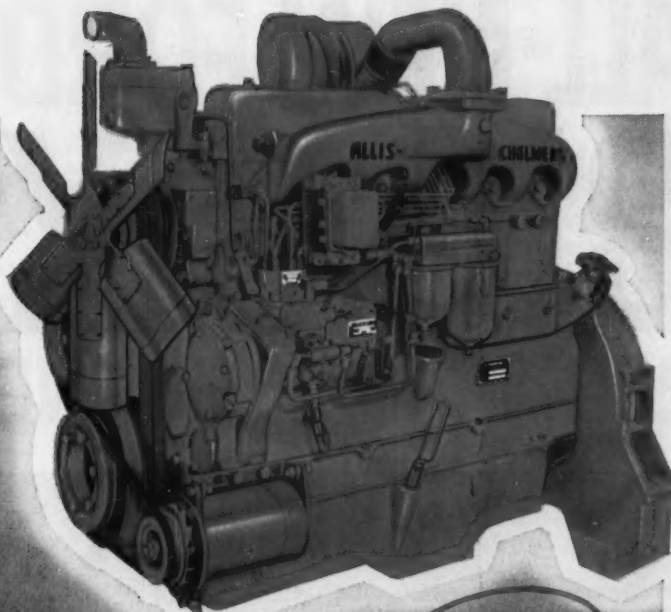
Peter Kiewit Sons Co., San Francisco, Calif. Build section of MacArthur Freeway, Alameda Coun-

continued on page 53

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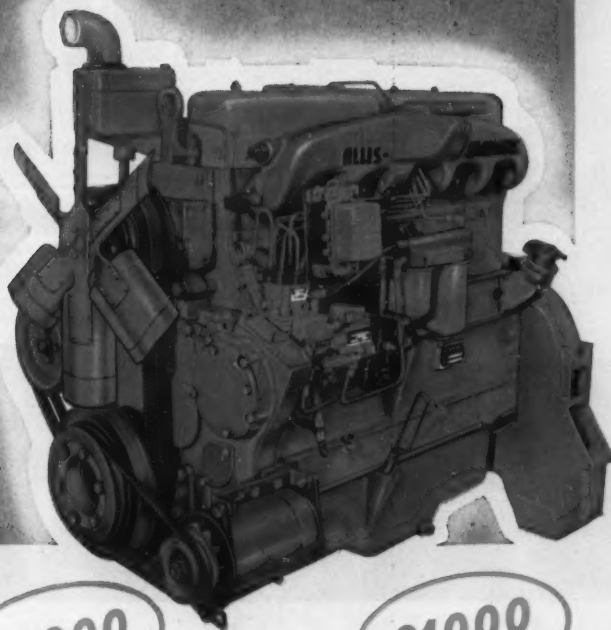
11000 and 10000 JOIN THE TEAM OF MODERN DIESEL

WORK POWER



210 hp
(turbocharged)

11000



145 hp

10000

350 hp
(turbocharged)

21000

235 hp

16000

ALLIS-CHALMERS

POWER FOR A GROWING WORLD



8E-24

Now there are four
of a NEW kind
designed to give you...

* LIGHT APPETITE FOR FUEL

Controlled turbulence mixes fuel and air thoroughly. Assures complete combustion — fuel savings to 27% and more!

"This new engine is not only doing the work of the larger engine it replaced, but is saving 30% and more on fuel!"

* HIGH, SUSTAINED TORQUE — RAPID RESPONSE

You have **work power** that hangs on to overloads over the entire speed range.

"Amazingly rapid response under heavy loads."

* CLEANLINESS IN DESIGN AND OPERATION

Efficient combustion converts fuel to **work power**, not smoke. There is no excess "plumbing" to invite service problems.

"Their clean, simple design makes them easy to service. To our knowledge, they are the best buy in a diesel engine for rough work today!"

* FAST STARTING

These engines start "right now" directly on diesel fuel. No ether, no pre-heating, no long work-robbing warm-ups even in freezing temperatures.

"Starting is excellent, even in the 0 to 10° range which we have fairly often here."

Find out how profitably this new kind of **work power** can serve you. See your Allis-Chalmers dealer or write for free bulletins — BU-718 on the 11000 and 10000; BU-540 on the 21000 and 16000. Allis-Chalmers, Milwaukee 1, Wisconsin.

THE NEWEST REASON TO MAKE
YOUR NEXT 2-TONNER A FORD

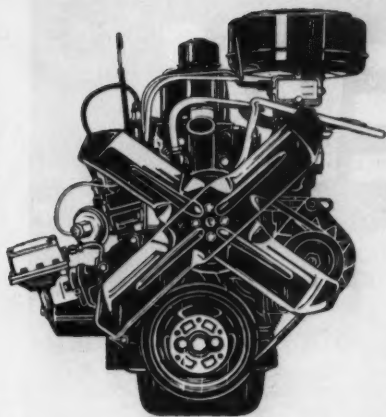
ALL-NEW FORD BIG SIX

262 ^{CU.} IN. TRUCK ENGINE



FORD DIVISION, *Ford Motor Company*,

New two-ton toughness! New stronger frame...huskier cab...rugged truck suspension that can give twice the front tire life of other types!



Now, the rugged simplicity of a big 262-cubic-inch Six is combined with the dependability of heavy-duty, *exclusive-truck* engine design. In a grueling 40,000-mile test of reliability, Ford's new Big Six was pitted against its principal competitor in the 2-ton field. Result: Ford's new engine required far fewer service adjustments. This means less time in the shop . . . more time on the job.

The new Big Six is one of *four* engine choices in Ford two-tonners for '61—including America's most popular truck V-8's. See your Ford Dealer. He will be glad to help you select the best engine for your job.

SEVEN MORE REASONS

WHY IT'S GOOD BUSINESS TO DO BUSINESS WITH FORD!

You save from the start with Ford's traditionally low prices! And your savings continue with lower operating and maintenance costs. These facts are documented by certified test reports from America's foremost independent automotive research firm. Ask to see these reports. They're on file at your Ford Dealer's.

In addition to these actual dollar-and-cents savings, the following bonus benefits provide greater protection against those annoying problems that are often associated with truck ownership.

1. Rigid quality controls give you the strongest safeguard of truck quality ever. One tangible result of these new and uniformly high standards is Ford's liberal new warranty program. Other results: extended durability and performance, lower operating costs.

2. 12,000-mile warranty (or 12 months) on *all* 1961 Ford Trucks of any size. Each part, except tires and tubes, is now warranted by your dealer against defects in material or workmanship for 12 months or 12,000 miles, whichever comes first. The warranty does not apply, of course, to normal maintenance service or to the replacement in normal maintenance of parts such as filters, spark plugs and ignition points.

3. Exclusive 100,000-mile warranty (or 24 months) on 401-, 477- and 534-cu. in. Super Duty V-8 engines. Each major engine part (including block, heads, crankshaft, valves, pistons, rings), when engine is used in normal service, is warranted by your dealer against

defects in material or workmanship for 100,000 miles or 24 months, whichever comes first. Warranty covers full cost of replacement parts . . . full labor costs for first year or 50,000 miles, sliding percentage scale thereafter.

4. Special fleet financing, available for owners of two or more trucks, provides the opportunity to precisely tailor payments to your income patterns or depreciation schedules. Let your Ford Dealer explain how this fleet truck finance plan offers substantial savings and frees your working capital.

5. 36 district offices staffed with sales engineers and service specialists are on call for special truck problems. Working with both dealers and customers, these experienced truck men represent another extra step Ford takes to provide your continued satisfaction.

6. Replacement parts depots at 26 strategic locations across the country quickly supply needed parts from ample stocks. Ford's entire supply system is geared to give you faster service and reduce costly downtime . . . *wherever you are.*

7. 6,800 Ford Dealers, including 273 specialized Heavy Duty truck dealers, can keep your trucks ready to go wherever they go. From coast to coast, fast Ford service—gas and Diesel—is always close at hand.

From Super Economy pickups to Diesel-powered tractors, you can now fill every truck need up to 76,800 pounds GCW with a modern, money-saving Ford Truck.

FORD TRUCKS COST LESS



SEE YOUR FORD DEALER'S "CERTIFIED ECONOMY BOOK" FOR PROOF!
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Illustrated Catalog of Bearings for Caterpillar Engines

Now, Monmouth offers you a complete line of solid aluminum and steel-backed aluminum bearings for Caterpillar engines and equipment. Identical to the original design, both connecting rod and main bearings are available for all makes and models.

Fully illustrated, this 20-page catalog helps you select the right bearing quickly—assures you of the highest duty material available. And you get more

crankshaft regrinds with the complete range of undersizes available, for popular models.

Ask your nearest NAPA jobber for your copy—and rely on him for complete stock and immediate service.

MONMOUTH Engine Bearings

CLEVITE SERVICE: Cleveland Graphite Bronze • Division of Clevite Corporation • Cleveland 3, Ohio



CONTRACTS AWARDED . . .

continued from page 48

ty, Calif. California State Div. of Highways, Sacramento. \$4,020,-820.

Guy F. Atkinson Co., Los Angeles, Calif. Construct three-berth wharf at Los Angeles, including railroad tracks, oil and water lines, electric conduit and necessary dredging. Los Angeles Board of Harbor Commissioners. \$1,-433,420.

Granite Construction Co., Watsonville, Calif. Construct section of six-lane freeway in Sacramento County, Calif. California State Div. of Highways, Sacramento. \$3,460,487.

Joseph F. Hughes Co., Baltimore, Md. Build Motor Vehicles Headquarters Building, Glen Burnie, Md. State Dept. of Public Improvements, Baltimore, Md. \$3,-810,000.

Runnymede Steel Construction Ltd., Toronto, Ont., Canada. Section of superstructure for high level bridge at Homer, Ont. Ontario Dept. of Highways, Downsview, Ont. \$3,379,500.

John A. Volpe Construction Co., Washington, D.C. Build hospital in Silver Springs, Md. Sisters of Holy Cross, Bethesda, Md. \$6,-239,000.

Wilaka Construction Co., Inc., New York, N.Y. General contract for E. Roberts Moore Houses, Bronx, N.Y. New York City Housing Authority, New York. \$3,668,000.

Grove, Shepherd, Wilson & Kruege, Inc., New York, N.Y. Build section of rapid transit subway in Manhattan. New York City Transit Authority. \$9,777,-001.

White Oak Excavators, Inc., Plainville, Conn. Build road in Wethersfield, Conn. Connecticut State Highway Commission, Hartford, \$5,010,104.

Lathrop Co., Toledo, Ohio. Build approach spans and ramps for Fort Duquesne Bridge, Pittsburgh, Pa. Pennsylvania State Dept. of Highways, Harrisburg. \$3,628,381.

continued on page 56



Will Never Owe You Anything!

Your OWEN Clamshell Bucket starts making money for you from the first hefty mouthful it bites off . . . and keeps on making money because its rugged construction "stands up". It's the bucket with "The Big Bite that's Just Right!"

The OWEN has a strong appetite for work—an appetite that is never satisfied. These are exclusive features that keep it working for you:

Block and Tackle Type Reeving **Recessed Lips**
One-piece Head Construction **Single Main Shaft**
Riveted Bowl Assembly

Prompt service through ample inventory on new equipment and parts.

Write for OWEN information on how these features can make money for you.

The  **OWEN**

BUCKET COMPANY

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Standby electric power for

Hospitals
Schools
Office Buildings
Homes
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Greenhouses
Dairy Farms
Hatcheries
Theaters
Stores
Service Stations
Radio & TV Stations
Hotels, Motels
Bridge Lift Gates
Toll Highway Booths
Restaurants
Banks
Military Installations
Resorts
Airport Towers
Microwave for Railroads
and Pipeline Distribution
Sewage Disposal
Water Treatment Plants
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Portable primary power for

Display Vans
Soft Ice Cream Vans
Airport Runway Lighting
Civil Defense Communication
Fire Dept. Lights, Tools
Police Radar,
Lights, Communications
Oil Exploration
Mining Equipment
Pipeline Distribution
House Trailers
Magnet Generators
Home Builders, Carpenters
Highway, Dam,
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Cemetery Maintenance
Golf Course & Park Maintenance
Electricians
X-Ray Equipment
Bookmobiles

Marine power for Pleasure Boats Work Boats



Auxiliary power for lights, communications, appliances on Work and Pleasure Boats.



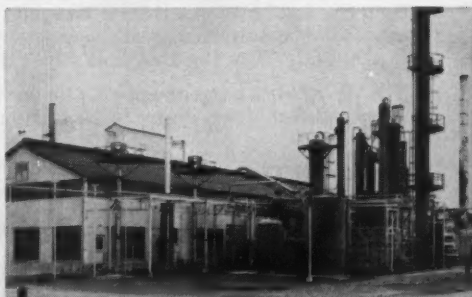
Portable power for pipeline X-Ray equipment, lights, tools and communications.



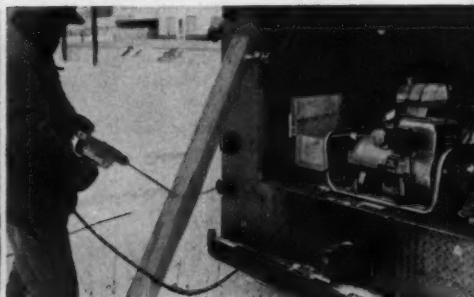
On-site power for construction tools, lighting in areas beyond mainline service.



Portable power for municipal maintenance equipment; tools, floodlighting.



Standby for critical processes in chemical, ceramic, and other manufacturing plants.



Line repair power and standby for electric, telephone, and gas utilities.



Provides power for lights, cooling, fudge heaters, fans for manufacturing ice cream vans.



Critical electric power for Civil Defense communications and lighting.

Onan Electric Plant that have never been used before an Onan plant free

We'll give a 1,000-watt air-cooled Onan* (shown below) for each of the ten best applications for an Onan plant that have never been used before. Your idea can apply to any size or type Onan plant—from 500 watts to 230 kw—gasoline or diesel, air or water cooled.

In 1926, when Onan pioneered with the "Ten-Lite"—a 250-watt d.c. plant—there was a clear-cut need: enough power to burn ten electric lamps in hundreds of thousands of homes without electric utility service.

Today, this market is virtually non-existent in the United States. But hundreds of new uses undreamed of in 1926 have increased the need for electric generator sets each year. Thus, because men with ideas continue to find new uses for packaged electric power, Onan continues to build more plants than any other manufacturer.

Quite often, we never know who had the original idea for a new application. And, we're sure, Onan plants are used today in ways

we've never heard about. If you have an idea for a new use, it may be helpful to you to see Onan plants at your local distributor. He's listed in the Yellow Pages in every major city. Or, write Onan for free literature.

*You may submit as many ideas as you wish, but no more than one Onan plant will be awarded to an individual. There are no restrictions on form of entry . . . you may submit photographs, sketches or a written statement of any length you desire. Onan will judge all entries on the basis of originality, practicality and commercial utility, and decisions of the judges will be final. If the same suggestion or similar suggestions are made by more than one entrant, the first one submitted, according to the postmark, will be eligible for the prize. Winners will be notified on or before July 15, 1961. Entries must be mailed to "New Uses Contest," address below, and must be received not later than June 15, 1961. All ideas submitted become the property of Onan and, whether or not the entries receive an award, may be used commercially by Onan in any way it sees fit with or without acknowledgment of the originator. No entries can be returned.



Here's the 1,000-watt Onan electric plant you may win for submitting your idea. Ideal for summer cottage, home standby . . . dozens of portable power uses. Don't put it off . . . send in your idea right away!



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NEW PARTS KITS

factory-engineered for
WISCONSIN ENGINES

You save up to four ordinary valve jobs with the new Wisconsin Stellite exhaust valve conversion kit — and for just \$12.85 per valve. Stellite resists extreme heat, abrasion, wear, galling, and pitting. Rotators prevent carbon and gum build-up.

Our TriCrome® ring sets enable you to re-ring Wisconsin Engines with moderately worn, tapered, and out-of-round cylinders for *one-third the cost of reboring*. And now you can get them in .010", .020", and .030" oversizes for the same price... from \$4.25 per set for singles to \$16.60 for the V-4's.

The 4-pack Oil Filter Cartridge kit, with gaskets, is a bargain at \$4.45. Calibrated to Wisconsin Engine pressures, these cartridges assure a correct flow of clean oil at all times.

Our high-temperature safety switch automatically protects your Wisconsin against burn-out through overheating... \$5.95.

Complete kits assure uniform performance, and cost less than if you bought the parts individually. Ask your Wisconsin Engine Service Station for Parts Bulletin Form S-280, or write Dept. C-31.

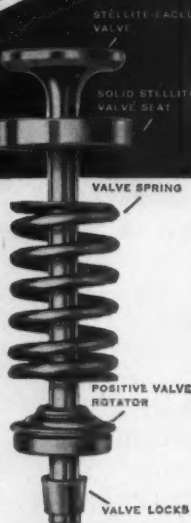


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MILWAUKEE 46, WISCONSIN

World's Largest Builders of Heavy-Duty Air-Cooled Engines

C-304



CHECK THESE TOO:

- Fuel Pumps
- Fuel Pump Repair Kits
- Carburetor Repair Kits
- Major Magneto Repair Kits
- Magneto Point and Condenser Kits
- Spray Paint Kit, with Decals
- and tools to make your servicing job easier

CONTRACTS AWARDED . . .

continued from page 53

Granite Construction Co., Watsonville, Calif. Roadbuilding in Sacramento County. California State Div. of Highways, Sacramento, \$3,460,487.

Low-Wright Contracting Co., Odenton, Md. Lowest of six bidders for highway and structures on Capitol Beltway, Montgomery County, Md. Maryland State Roads Commission, Baltimore. \$3,548,311.

Nolan Brothers, Inc., Wichita Falls. Construct spillway and embankment for John Redmond Dam and Reservoir, Grank Neosho River, Kansas. Corps of Engineers, Tulsa, Okla. \$6,642,236.

Angelo Tomasso, Inc., New Britain, Conn. Contract for Interstate 84, Southington, Conn. Connecticut State Highway Commission, Hartford. \$5,159,726.

Kraus-Anderson, Inc., Minneapolis, Minn. Build 23-story apartment in St. Paul, Minn. 740 River Drive, Inc., St. Paul. Estimated cost is \$3,000,000.

Morair Engineering Corp., Washington, D.C. Construct buildings at St. Elizabeth's Hospital, Washington. General Services Administration, Washington. \$3,189,000.

Del E. Webb, Phoenix, Ariz. Construct Capehart housing at Offutt Air Force Base, Fort Crook, Neb. Corps of Engineers. \$6,559,900.

Empressa Construcora Raefel Herrera, Ltd., San Jose, Costa Rica. Build four-lane highway between San Jose and El Coco Airport, San Jose. National Procurement Office. \$3,495,430.

Morrison-Knudsen International Constructors, H. K. Ferguson Co., and Girdler Construction Co. Design and construct a \$38 million urea plant at Palembang, Sumatra. Government of Indonesia.

George A. Fuller, Los Angeles, and **Del E. Webb Construction Co.**, Los Angeles. Construct Minuteman missile complex at Malmstrom Air Force Base, Great Falls, Mont. Corps of Engineers Ballistic Missile Construction Office, Los Angeles, Calif. \$61,773,644.

FOR GENERAL CONTRACTORS

General Contracting really is *different* from other business. It is unusually complicated and sometimes General Contractors unwittingly get into trouble. Calling a lawyer or ordinary management consultant is not *always* the answer.

If your firm is doing more work and profiting less or if it is having trouble maintaining satisfactory volume, we can help. It takes a special kind of knowledge and experience to solve your kind of problem. This is our business.

All inquiries are in strictest confidence.

CONSTRUCTION MANAGEMENT SERVICES
A Division of

EQUITABLE MANAGEMENT, INC.

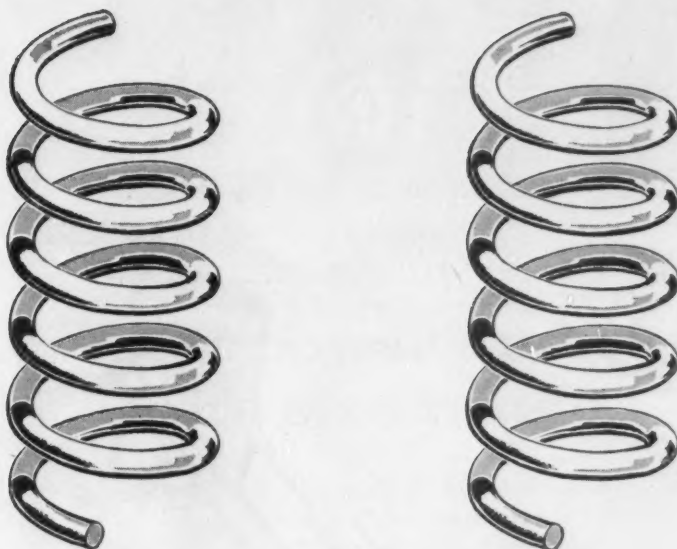
690 Market Street
San Francisco

521 Fifth Avenue
New York

Circle 301 on Reader Service Card

GIVE





Why hard and soft SPI-RAL rods?

Suppose you want a rod with the extra hardness, wear-resistance and long life of tough carburized alloy steel, and don't want to consider reconditioning; then the Ingersoll-Rand 1 1/4" hex SPI-RAL rod is for you.

On the other hand if you want the extra economy of a rod that can be reconditioned good-as-new, and used over and over again,

then you want the non-carburized Ingersoll-Rand 1 1/2" round SPI-RAL rods. They are made of a special grade alloy steel, pre-treated to make it the hardest workable steel available.

Ask your Ingersoll-Rand man about these two fast-lead rods for your CRAWL-IR jobs today.

CARBURIZED



RECONDITIONABLE



Ingersoll-Rand
226A5 11 Broadway, New York 4, N. Y.



A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

Circle 57 on Reader Service Card



11000 turbocharged diesel engine—conservatively rated at 184 hp, features Allis-Chalmers unique controlled turbulence principle that gives you more work power for less fuel dollar.

New ARROWHEAD cutting edge—provides longer life and adds protection and strength for the bucket bottom and side plates.

Safe, sure air brakes—four-wheel air brakes let you work with confidence on the steepest grades and stockpiles. If air pressure should fall below 55 psi, an interrupter in the horn circuit warns the operator in plenty of time to make necessary adjustments.

Full box frame—soaks up stress and strain . . . offers outstanding balance and stability . . . permits efficient equipment mounting.

NEW TL-30

184 hp
10,500-lb carry capacity
2½- to 6-cu-yd buckets
Weight: 28,400 lb

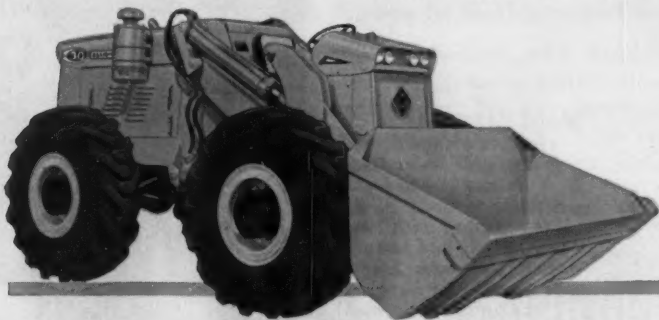
Best power and capacity in its size range

The new Allis-Chalmers TL-30 will give you more production than any other loader in this class. Its modern 11000 turbocharged diesel delivers 184 hp . . . up to 13 percent more power than others its size. This high-power output is delivered by a combustion system that has established itself as the most efficient in the industry. Proved in other Allis-Chalmers engines, this controlled turbulence, open combustion chamber design, gives you thorough mixing of air and fuel for complete, fast and even combustion . . . high fuel economy.

When it comes to carry capacity, the new TL-30 sets the pace in the industry. It carries up to 10,500 lb . . . a big 16-percent bonus over other loaders in this size range. This extra capacity lets you increase material flow . . . reduce handling costs on every shift.

The new TL-30 also features the same exclusive design and construction advantages in other Allis-Chalmers tractor loaders. Single-lever control; high dumping clearance and long reach; pin-connected axles; 5-way hydraulic filtering protection; safe dump cylinder location and added loader stability are some of the reasons why Allis-Chalmers tractor loaders have received tremendous acceptance by contractors, road builders and public officials around the country . . . in fact, around the world.

Before you decide on your next loader, make sure you get the complete story on the new TL-30, plus information on the other five tractor loader models—from 77 to 130 hp . . . 3,600 to 9,000-lb carry capacities. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



move ahead with

ALLIS-CHALMERS

... power for a growing world

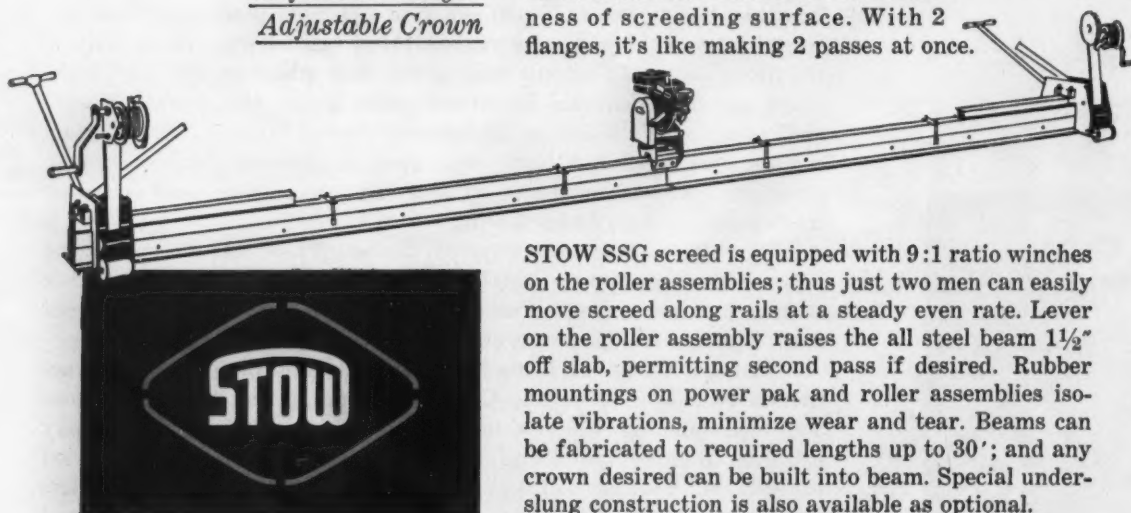


Circle 59 on Reader Service Card

NEW
ALL-STEEL
DOUBLE FLANGE
VIBRATING
SCREED

Adjustable Amplitude
Adjustable Speed
Adjustable Length
Adjustable Crown

Greater adjustability is the key to superior performance in the NEW STOW SSG STEEL SCREED, making it ideal for striking off concrete surfaces to a true grade. Adjustable amplitude feature on the 3 HP gasoline-engine driven power pak, plus throttle speed control, delivers exactly the right amount of vibration to suit job conditions. Roller assemblies can easily be moved back and forth on the beam for a span adjustment of up to 6 feet. The two 3-inch wide flanges can be adjusted up or down along length of beam to maintain correct crown or flatness of screeding surface. With 2 flanges, it's like making 2 passes at once.



STOW SSG screed is equipped with 9:1 ratio winches on the roller assemblies; thus just two men can easily move screed along rails at a steady even rate. Lever on the roller assembly raises the all steel beam $1\frac{1}{2}$ " off slab, permitting second pass if desired. Rubber mountings on power pak and roller assemblies isolate vibrations, minimize wear and tear. Beams can be fabricated to required lengths up to 30'; and any crown desired can be built into beam. Special underslung construction is also available as optional.

For up-to-date information on the complete line of STOW CONCRETE CONSTRUCTION EQUIPMENT—call your STOW distributor or write for Catalog 610.

Model SASG (shown at right on bridge deck) is available in lengths from 20 to 50 feet. Similar to Model SSG, it is equipped with two power paks and has an adjustable center hinge assembly for a crown of up to 3". Special underslung construction available also.



STOW MANUFACTURING CO., DEPT. B-10, 31 SHEAR ST., BINGHAMTON, NEW YORK

Circle 60 on Reader Service Card

CONSTRUCTION METHODS

Better products, *faster*, from your Federal-Mogul jobber:

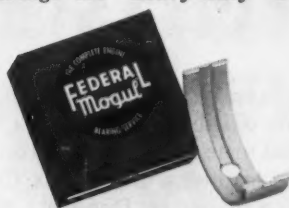


Power-packed bites test engine bearings

Ask the mechanics who keep heavy equipment on the job 'round the clock. Big, rugged construction equipment calls for plenty of power at all times. That requires engines that can deliver full horsepower . . . bearings that can stand up under peak loads. And that's why Federal-Mogul engine bearings are "heavy-duty" built for this kind of

job. It's why Fm bearings extend overhaul intervals.

When you overhaul with Federal-Mogul engine bearings, the job moves faster. An unlimited supply is always nearby. Precision inserts insure correct oil clearances automatically—make them easier to install. Call your Federal-Mogul jobber. He is always ready with full stocks.

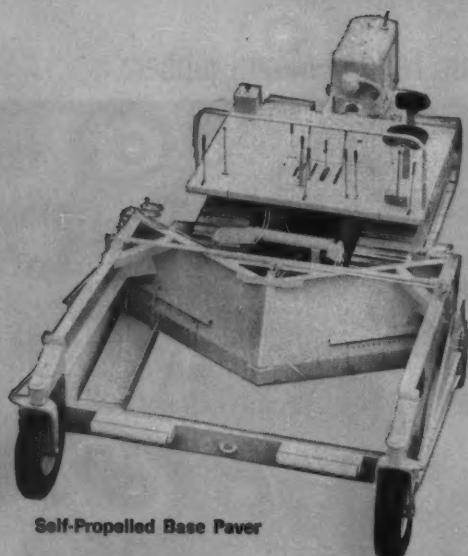


FEDERAL-MOGUL ENGINE BEARINGS

FEDERAL-MOGUL SERVICE

DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 13, MICHIGAN





Self-Propelled Base Paver

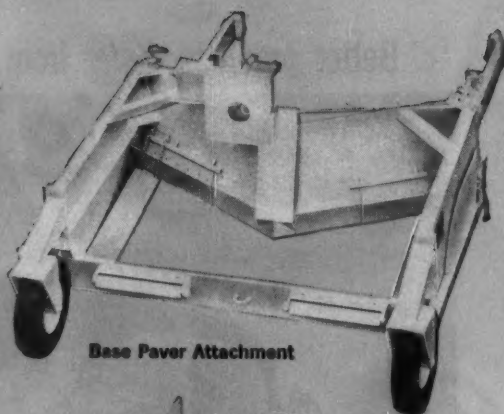
Self-Propelled Base Paver—Big capacity unit spreads stone, slag, gravel, soil cement or plant mix aggregates 1" to 20" deep in widths from 10'-10" to 16'-0", at the rate of more than 400 t.p.h. Tractor unit is equipped with 21" wide crawler shoes for maximum traction and flotation on softest base. Equipped with high-speed oscillating screed, front wheel power steering, dual controls. Four forward and four reverse working speeds, one forward and reverse travel speed.

Base Paver Attachment—Big capacity unit designed especially for use with standard tractors of sufficient power. New universal hitch makes attachment easy. Equipped with its own engine-driven oscillating screed, and mechanical crown adjustment. Spreads stone, slag, gravel, soil cement and plant mix aggregates 1" to 20" deep in widths from 10'-10" to 16'-0". Hopper lifts completely for travel.

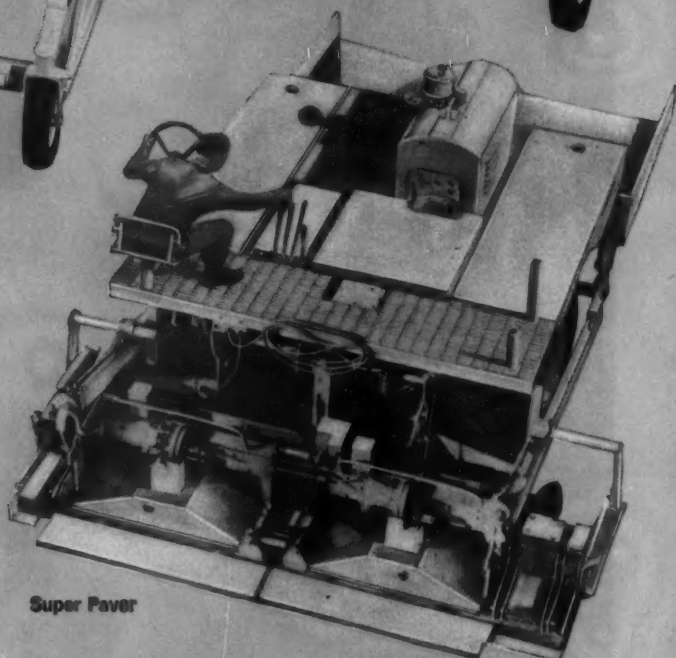
Super Paver—Automatic, air-electric fingertip controls, 12-ton hopper with hydraulic folding wings. Independent control of left and right conveyors interlocked with control of augers. Automatic control of material level ahead of augers. One piece screed in 10' width with extensions to 19'. Hydraulically driven tamper. Full hydraulic wheel steering. Eight paving speeds

from 16 f.p.m. to 117 f.p.m. Four forward and reverse travel speeds from 6 to 11 m.p.h.

Drive wheels equipped with 16:00 x 25 low-pressure earth mover tires. Full power brakes. Gasoline or Diesel power plant. Option: revolutionary new grade control for averaging out grade imperfections, determining grade from guide devices, adaptation to previously cut grade variations and matching previously laid mat.



Base Paver Attachment



Super Paver

Suburban Paver—Automatic control, 4-ton hopper, hydraulic folding wings. Right and left conveyors synchronized with augers. One piece screed with extensions to 12'. Full hydraulic wheel steering. Five paving speeds from 10 to 127 f.p.m. Travel speed 8.6 m.p.h. New hydraflated 10:00 x 20, 12-ply tires, and locking differential. Option: new grade control for averaging out

THE NEW LOOK IN BITUMINOUS PAVING:

MORE AUTOMATIC,

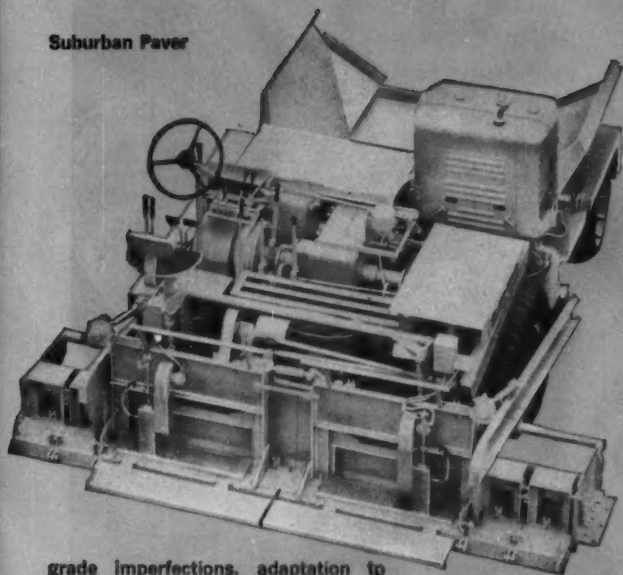
Here's the bituminous paving line designed to give you top quality, fully automatic production from base course to final binder.

Check the automatic features, the capacity and versatility of these new and improved Blaw-Knox machines. They'll help you bid closer, work tighter

and make more money starting right now.

Your Blaw-Knox distributor has all the information. He'll be glad to help you get started on the way to bigger paving profits. Blaw-Knox Company • Construction Equipment Division • Mattoon, Illinois.

Suburban Paver

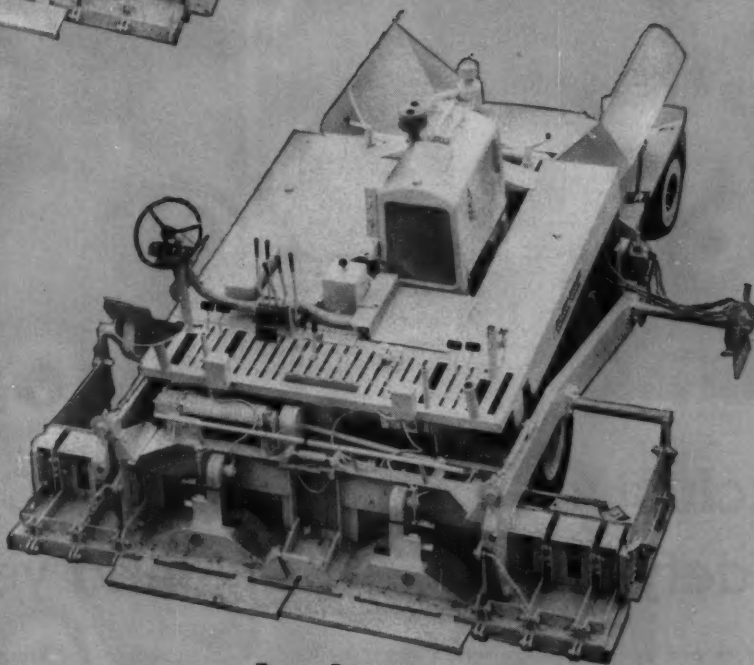
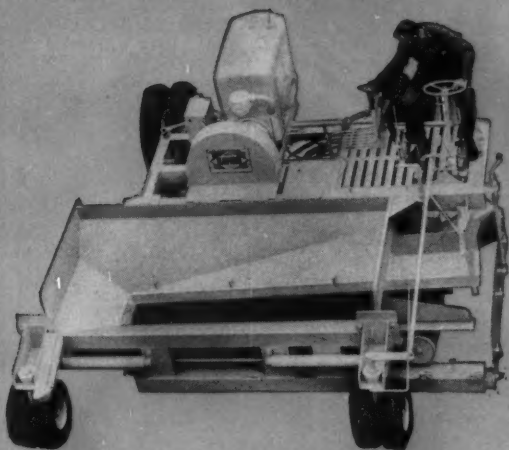


grade imperfections, adaptation to previously cut grade variations, and matching previously laid mat.

Road Widener—Versatile, one-man unit spreads any kind of aggregate, lays all types of bituminous mixes, spreads and finishes concrete. Spreads aggregate and bituminous materials in 2' to 10' widths, spreads and finishes concrete in 2' to 6' widths. 15' slip form attachment for concrete widening. Strike-off gate assemblies for each type material used. Spud vibrators for low slump concrete.

Express Paver—Automatic air-electric fingertip controls, 10-ton hopper with hydraulic folding wings. Independent control of left and right feed conveyors interlocked with control of augers. One piece screed design with extensions to 16'. Full hydraulic wheel steering. Eight paving speeds from 10 to 62 f.p.m. Travel speed 7 m.p.h. New hydraulically inflated 10:00 x 20, 12-ply tires. Gasoline or Diesel power plant. Option: new grade control for averaging out grade imperfections, determining grade from guide devices, adaptation to previously cut grade variations and matching previously laid mat.

Road Widener



Express Paver

VERSATILE, RUGGED THAN EVER BEFORE!

BLAW-KNOX *Construction Equipment*

Circle 63 on Reader Service Card



LUFKIN
CHROME CLAD®
SUPER HI-WAY TAPE



LUFKIN
CHROME CLAD®
ANCHOR TAPE

Exclusive LUFKIN Chrome Clad® lines defy sand, mud, grit, and years of use!

Engineers and construction workers swear by 'em. Because the bold, black markings are *bonded* to steel... protected by layer on layer of electroplating... topped by a final coat of chromium!

Exclusive quality features are yours in *all* Lufkin tapes. For example:

Lufkin Super Hi-Way (above, left) is built to *last*. A real drag tape. Raised markings and protective borders are part of the tape! Can't come off! And special steel resists kinking. Available in 100', 200' and 300' lengths.

50-ft. Anchor Chrome Clad (above, right) is available with easy-to-read markings in feet, tenths and

hundredths, in genuine-leather, hand-stitched case. The handiest thing you can carry, on job after job.

See your Engineering Supply House now... for the Lufkin tape that's designed for *your* kind of work.

Measure for measure, the finest made...

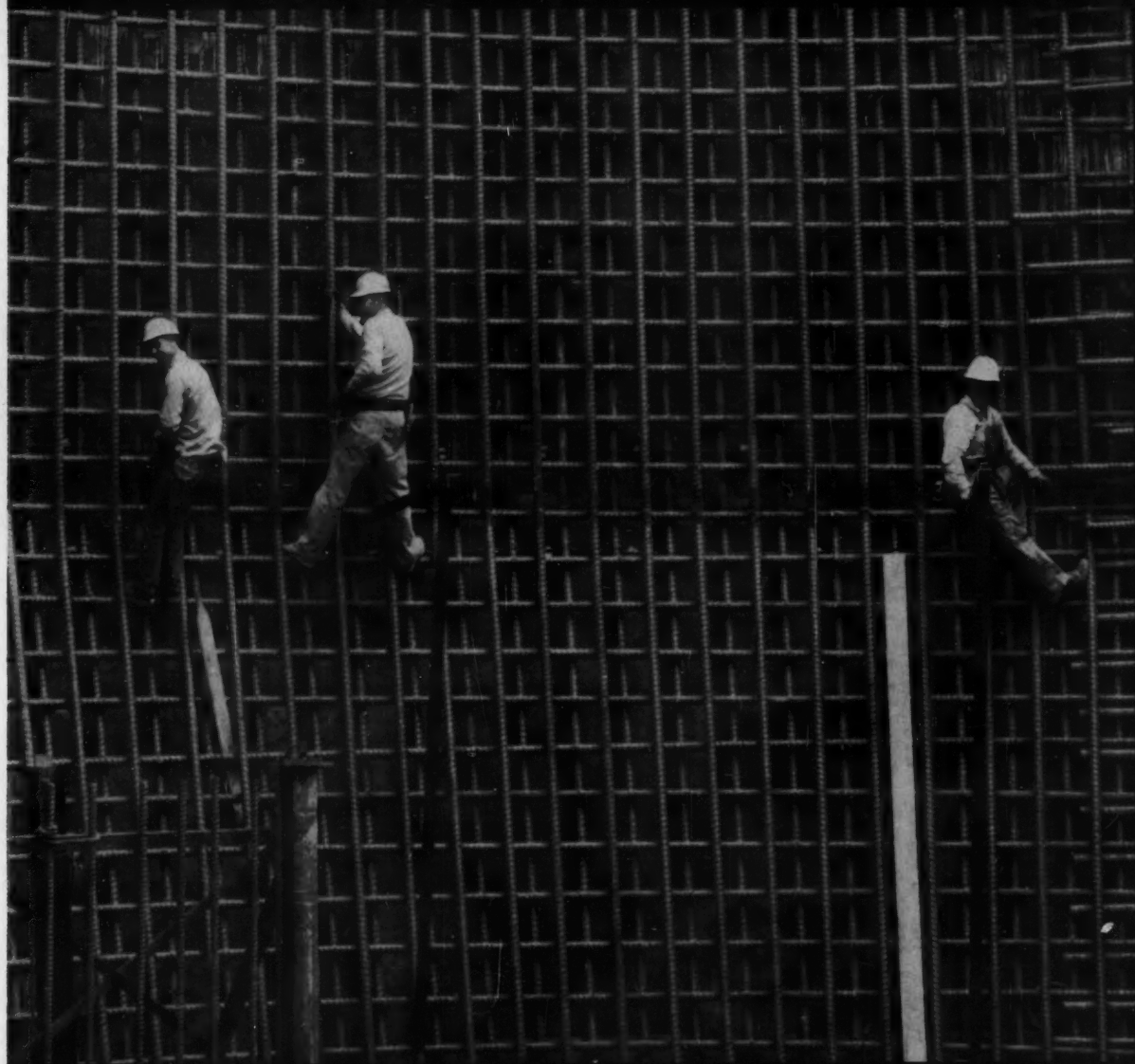
LUFKIN

SAGINAW, MICHIGAN

Circle 64 on Reader Service Card

Missile Silo Monkeys

PICTURE
OF THE
MONTH



- Steelworkers clamber about with sure-footed nonchalance as they place reinforcing in the wall of a 175-ft-deep missile silo near Salina, Kan. The Ryerson Steel Co. crew placed 600 tons of reinforcing steel, then prime contractor Utah-Manhattan and Sundt Co., a joint venture, poured more than 3,000 yd of concrete to complete the massive enclosure. Convair Division of General Dynamics Corp., builder of the Atlas, is responsible for activation of the launch site.

3,500,000 CUBIC YARDS OF CONCRETE . . .

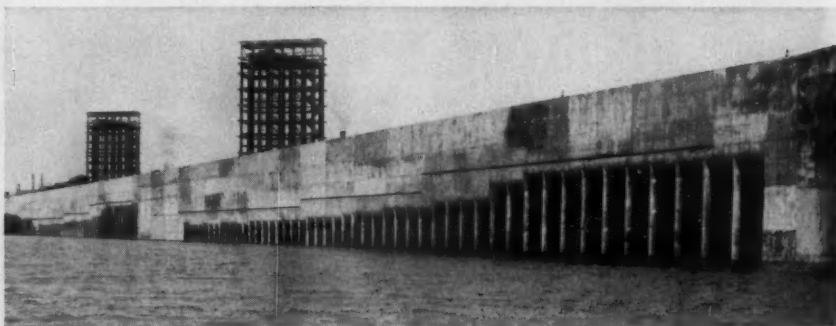
That's the quantity required for the western world's largest power installation—the Niagara Power Project. Neither words nor figures, nor the pictures here, can truly describe the magnitude of this Project. Only those who had an opportunity to see it during construction can fully appreciate the planning skill, the coordination of men and mate-

rials, and the construction techniques that have made it a reality.

We are proud to have been the major supplier of cement for the 3½ million cubic yards of concrete needed for this project.

Lehigh Portland Cement Company
ALLENTOWN, PA.

1 The "harmonica" intakes are two reinforced concrete sections, each 700' long, located 2½ miles above Niagara Falls. Each section admits water to its own concrete conduit. In operation, tops of the intake slots vary from 13' to 26' below the river surface. The gate structures for each conduit are seen above the intakes. **Contractor:** Merritt, Chapman and Scott Corp.

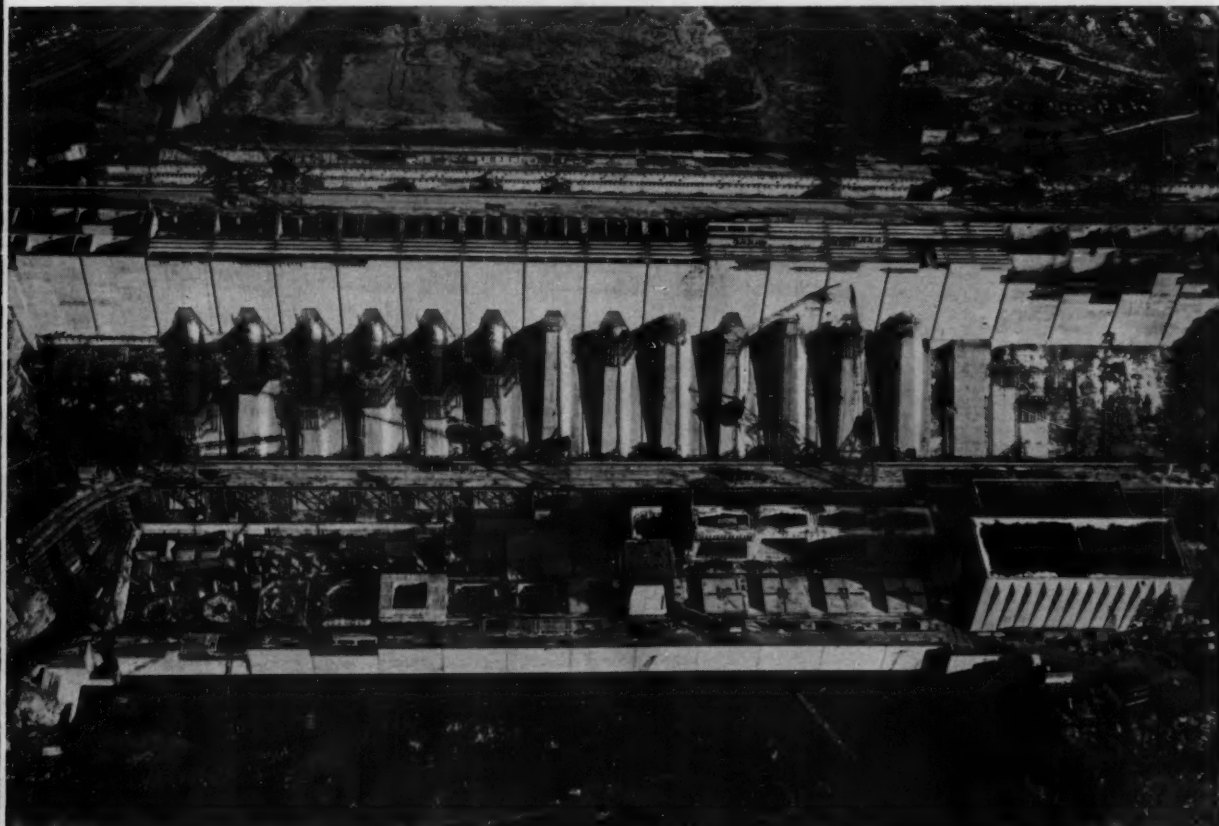
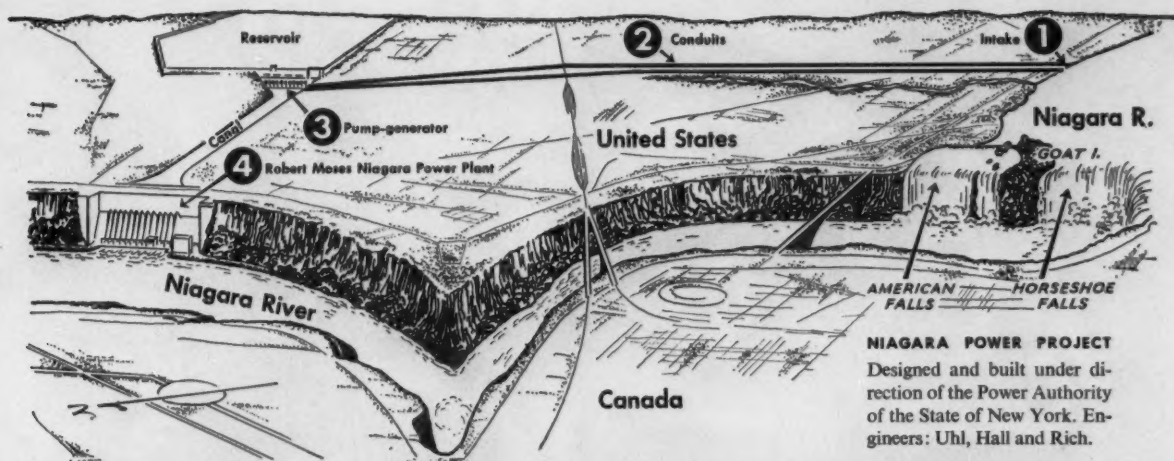


2 A section of one of the two concrete conduits which run from the intakes some 4 miles through the city of Niagara Falls and the towns of Niagara and Lewiston. Walls and floors of conduit are a minimum of 2½' thick, and the haunch section is about 7' thick. The arch is 5' thick at the top and 6' at the base. The inside of each conduit measures 46' wide by 66' high to the crown of the arch—a size equivalent to six double-track railroad tunnels. Conduits were built in 40' sections employing traveling concrete forms. Tops of the conduits average more than 40' below the ground surface. **Contractors:** Merritt, Chapman and Scott Corp.; Edward Balf Co., Savin Brothers and D. W. Winkelman in joint venture; Gull Contracting and L. G. Defelice & Son in joint venture.



3 Water enters open canal from conduits. Pump-Generating plant is 974' long, 160' high and 240' wide. Reversible pump-turbines pump extra water available at night, under U. S.-Canadian treaty, into a storage reservoir. During daylight hours water is released through these reversible units to provide 240,000 kw. Water then continues to main generating plant to be reused for more power. The lower deck of the plant is extended over draft tube outlets to serve as a bridge to carry the permanently relocated Military Road and the new Niagara Expressway. **Contractors:** Tuscarora Contractors, Arundel Corp., L. E. Dixon Co., and Hunkin-Conkey Construction Co. in joint venture.





4 The Robert Moses Niagara Power Plant seen here, in combination with the reservoir plant, forms the western world's biggest power project. The reinforced concrete structure is approximately 1,840' long—the length of five football fields. It is 389' high, 580' wide. The 13 penstocks (the first generator began operating February 10) are concrete encased and concrete anchored. Two four-lane concrete highways will pass over the downstream face of the intake structure. Some of the 599 prestressed concrete beams to carry these roadways can be seen in the photo. Contractor: Merritt, Chapman and Scott Corp.

**LEHIGH
CEMENTS**



UNIT

MODEL 617

"a real money-making rig..."

"... fast and easy to run. It's stable and doesn't bounce around even on jobs like this where we've pounded through most of this rock without resorting to blasting." That's what S. E. Light—a "shovel runner" since 1932—has to say about this $\frac{3}{4}$ -Yd. Model 617 UNIT trencher. Owned by R. R. Blakeman, Los Angeles, the UNIT is digging ditch up to 8' deep and 36" wide for a new storm drain. Tough digging conditions were taken in stride—hard adobe mixed with rock.

UNITS are fast because a unique *direct-in-line drive* provides power where it's wanted and when it's needed. Engine power is transmitted to the main machinery in an even and steady flow through a worm-driven power take-off with a "one step" speed reduction. There's little power loss through friction.

UNITS are easy to run because *disc-type operating clutches* provide fast, smooth response. There's no jerking or grabbing as clutches are engaged and disengaged.

UNITS are stable... don't "bounce around". The combination of *hook and turntable rollers* insure stable operation with long booms or digging attachments. With the crawler frame assembly constructed of husky side-frames and H-beam axles, the shocks and strains of heavy-duty work are easily absorbed; perfect balance and operating stability are provided.

To find out more about a UNIT, contact your nearest dealer. He'll be glad to give you complete details on any or all sizes.

SHOVELS: $\frac{1}{4}$ Yd. to 1 Yd. • CRAWLER CRANES: 6 Ton to 22 Ton •
DRAGLINES: $\frac{1}{4}$ Yd. to 1 Yd. • TRENCHERS: $\frac{1}{4}$ Yd. to 1 Yd. •
TRUCK CRANES: 10 Ton to 40 Ton

UNIT
UNIT CRANE & SHOVEL CORP.
6305 W. Burnham Street
Milwaukee 19, Wisconsin

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CONSTRUCTION METHODS



GMC DIESEL



You get rugged, o
more inside o
short BBC dimer
carry bonus p
smoother

**EXCLUSIVE
ECONOMY RANGE
GOVERNOR**

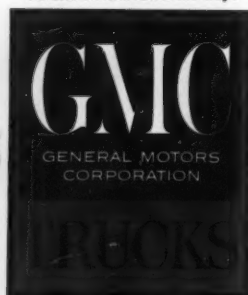


● Greatest combustion efficiency with ma
performance than naturally aspirated engin
exclusive automatic hydraulic fan ● Fou
complete exhaust scavenging, give a cool
plete fuel combustion ● Replaceable dry



**THE
TRUCK
TRIUMPHS
OF THE
60's!**

From ½-ton to 60-ton
General Motors leads the way!



GMC Truck & Coach—a General Motors Division—Pontiac, Michigan



— 218 hp. V-8 Die
Out in The Op
Other features o
are: 72" BBC an
tion for big loads
you can get; sh
job-matched dies
lbs. GVW to 76,8

**GMC's Biggest
60-ton Tractor**
with 90" BBC an
location for bigg
ventional Ninety
diesels, are idea
struction jobs fr

V-6 ELS

SHORTEST, LIGHTEST AND LEAST EXPENSIVE TO OWN—IN THEIR CLASS!

ed, compact construction . . . many inches shorter for
de cab room, simpler servicing and full advantage of
dimensions—lightest weight, up to 530 pounds less, to
us payloads—two-cycle design for faster acceleration,
ther power, exceptional fuel economy and added life.



Only GMC diesels have this economy range governor that positively regulates engine speed at the most efficient rpm for top fuel economy and longer engine life. Standard equipment on 4-wheelers.

BIG PULLING POWER! HIGH PERFORMANCE! 6V-71 GMC TRUCK DIESELS

MAX. TORQUE
604 @ 1200

MAX. HORSEPOWER
197 @ 1800
to
218 @ 2100

Ratings are at sea level and 60°F.

h maximum air intake from Roots-type blower ● Better high-altitude engines ● Save up to 5% on fuel, get up to 12 extra horsepower with Four exhaust valves for each cylinder (not just 1 or 2) assure more cooler-running engine, lengthen valve life and provide more complete dry-type cylinder liners are leak-proof, quick and easy to service.

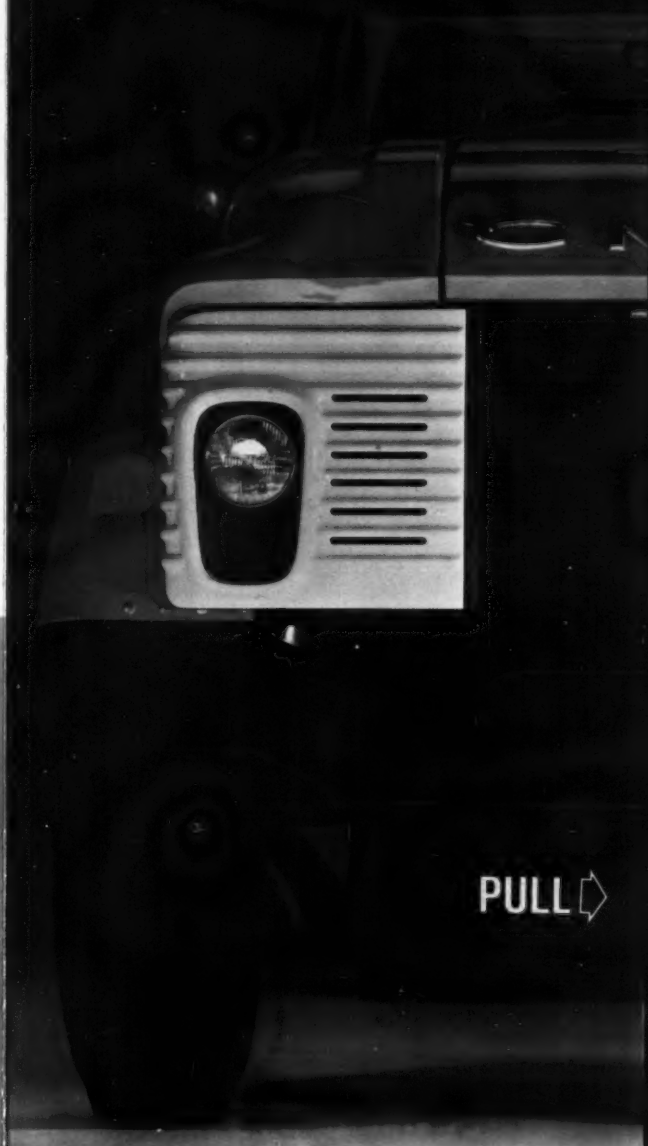
6 Diesel Engine is Right
Open with the cab tilted.
res of GMC steel tilt-cabs
BC and 52" front axle loca-
loads; biggest safety vision
t; sharper turning angles;
d diesel power from 32,000
76,800 lbs. GCW.

ggest, Diesel-Powered
ractor—DBW9000 Series
BC and 28-inch front axle
biggest legal loads. Cen-
Ninety-Inchers, with V-6
ideally suited to all con-
bs from 30,000 lbs. GVW.



POWER REASONS

WHY GMC'S ARE THE
MOST ADVANCED
CONSTRUCTION
TRUCKS IN 20 YEARS



EXCLUSIVE GMC ENGINES ARE BUILT TO



Short, Stout Design! Low-Rpm Power! GMC V-6s have exclusive long-life strength. Deep-skirted block has extra-reinforcing ribs and structural superiority throughout. Full-power at low engine speed and shortest stroke of any comparable truck-built engines reduce power-robbing wear, add to greater fuel economy and provide the desired, higher performance.

Cooler-Running, Stronger, Bigger Valves... Everything For Longer Life!

1 Extra-long valve guides, integral with head, minimize stem exposure to burning gases and assure faster transfer of heat. **2** Positive rotation of both intake and exhaust valves (except 305A) give valves self-cleaning action to prevent sticking, pitting, warping, leaking and burning.

3 Valve stems are short and big diameter to practically eliminate distortion. Sodium-filled exhaust valves* more rapidly transmit damaging heat through the valve guides to the coolant. **4** Up to 176 gallons of coolant circulating every minute (over twice as much as many competitive engines) provide the flow necessary for life-prolonging heat transfer. **5** Hard, tough, special steel is used in the exhaust valve seat inserts of heavy-duty V-6 engines to withstand high temperatures and constant seating action. **6** Valve heads and ports are extremely large for better breathing. Special hard facing resists pitting, corrosion, fatigue and wear. **7** Wide bridge between valves provides added strength and big cooling areas for better heat dissipation. *(Except 305s)

HERE'S YOUR COMPLETE CHOICE OF EXCLUSIVE GMC V-6 GAS ENGINES

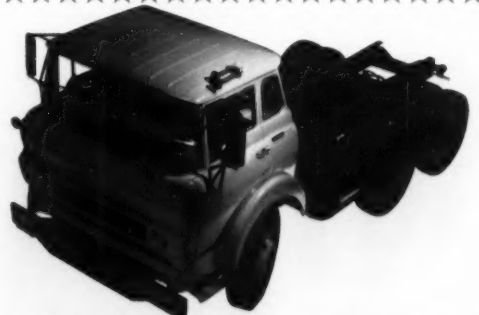
MODEL	GROSS TORQUE RANGE	MAX. HP.
305A	258-260 @ 1400-2200	150 @ 3600
305B	264-266 @ 1100-2000	150 @ 3600
305C & D	268-270 @ 1200-2100	165 @ 3800
351	308-312 @ 1400-2400	180 @ 3400
401	375-377 @ 1200-2000	210 @ 3400



Lower Maintenance Costs! Adjustments, repairs and replacements are easier and less costly with GMC engines. For example—spark plugs are conveniently located inside the V. Self-locking screws make valve lash adjustments a simple job. Most major parts are interchangeable between V-6 engine models, and several with Twin-Six engines. Expert service and all parts are readily available at GMC Truck Dealers located across the country.



Low Buying Cost! Low Owning Cost! That's the new GMC 105" BBC Conventional 6-wheelers with 105" BBC cab, 351 or 401 V-6s. Servicing is convenient with wide hood and roomy engine compartment. Easy-in-and-out conventional cab trucks start with choice of 34 pickup combinations and go up to 60,000 lbs. GCW tractors.



Out-Earns, Out-Pulls All Trucks in Its Class... GMC steel tilt-cabs with exclusive 275 hp. Twin-Six. These easy-to-service, easy-to-drive models with 72" BBC and 52" front axle placement are also available with GMC V-6 engines. Full line, 19,500 lbs. GVW to 76,800 lbs. GCW, cannot be surpassed on any construction haul.

FOR ALL THE PROFIT-FACTS, CONTACT YOUR GMC DEALER LISTED IN THE YELLOW PAGES OR VISIT

OUT-LAST, OUT-POWER OTHER GAS ENGINES!

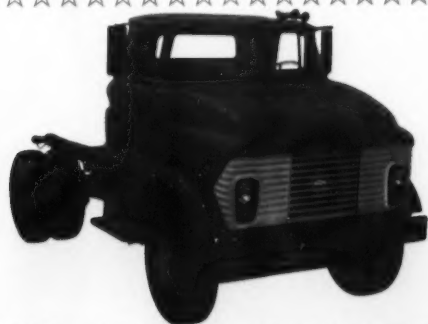


Greatest Pulling Power Of All! This 702 cu. in. Twin-Six gas engine produces the most usable power of any standard equipment engine. You get great reserve power at low engine speed to haul loads at part throttle under normal conditions . . . using reserve only for hills. You save fuel, reduce shifting up to 60% and get longer engine life.



← **Notice The Full 3-Inch Extended GMC Skirt** for the most rigid, full crankshaft support. New compact design, extra strong inner ribbing and staggered cylinders all increase strength and rigidity, decrease costly wear and failures.

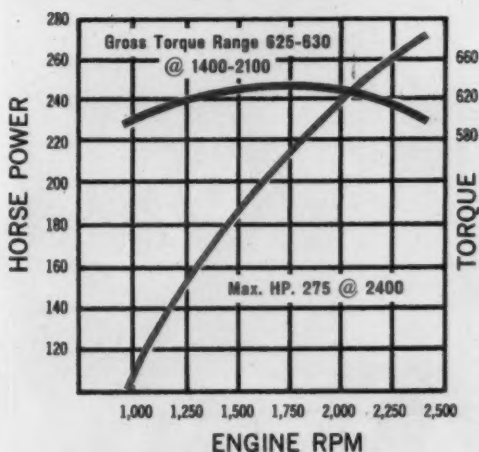
→ **Tamper-Proof, Positive Speed Control Governor!** This GMC patented hydraulic governor operates by direct oil pump pressure to accurately, reliably control proper operating speeds . . . adds to engine life. Standard on 401 and 702 engines.



Exclusive V-8 Power is standard in medium-heavy duty 90" Conventions along with easy-driving independent front suspension and easy-riding vari-rate rear springs on 4-wheel models. Ruggedly reinforced cabs with double-walls stand up on the roughest construction jobs. Heavy-duty models have the powerful Twin-Six.

VISIT ANY CONTRACTORS USING NEW GMC TRUCKS.

EXCLUSIVE, HIGH-PERFORMANCE GMC TWIN-SIX





*To solve design problem of less shock,
easier operation, EIMCO® CHOOSES
CLARK CONVERTER*

Put yourself in Eimco's place. In 45 years of building tractors and rugged underground loaders, you've earned a world-wide reputation for dependability. Now you're planning a new 100 hp crawler. Overall design is very important. So too is selection of power train components. You study and test—and finally pick a Clark torque converter as standard equipment. You name three reasons . . .

One—From the wide variety of torque converters Clark has in standard production, one can be selected to exactly fit the need. In this case, the Clark converter efficiently links an Eimco-built transmission with GM or Cummins diesel engine.

Two—Clark products have an excellent reputation for dependability.

Three—Price is fair, delivery good.

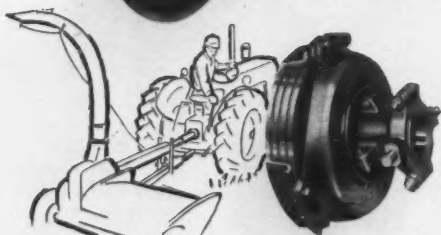
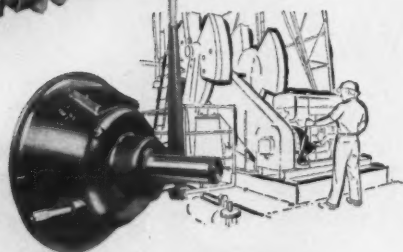
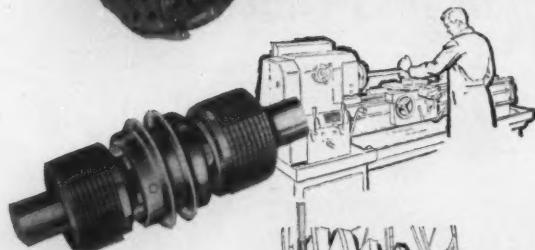
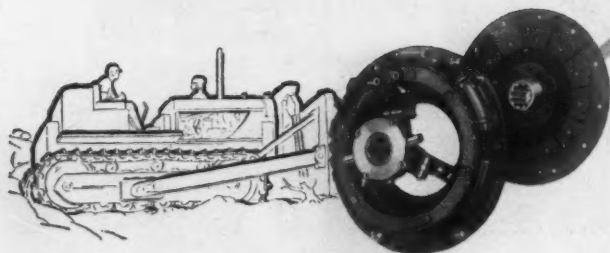
There are some important operational advantages too. Easy shifting, even first to fourth, at the flick of a finger. Shock-free changes of direction. Less wear and tear on power train and operator.

For more facts on the advantages of Clark torque converters as applied to your equipment, clip this coupon to your letterhead and mail to:

**CLARK
EQUIPMENT**

CLARK EQUIPMENT COMPANY
AUTOMOTIVE DIVISION
BUCHANAN 6, MICHIGAN

DYNAMIC POWER CONTROL by ROCKFORD CLUTCH



EXTRA THICK FACINGS GIVE LONGER LIFE

Rockford Clutches have maximum thickness facings . . . up to 1/32" more friction material. Only the highest grade materials are used. Rockford's extra long-life facings reduce scoring and greatly cut costs of downtime, replacement and labor.

TORTURE PIT TESTING ASSURES SAFE OPERATION

Torture testing pits burst clutches to bits! At specified intervals, clutches are removed from the production line to undergo severe centrifugal tests. These clutches are spun to destruction but must withstand predetermined high speeds and specified time limits.

STRONG CONSTRUCTION WITHSTANDS RUGGED SERVICE

Corrosion resistant discs are made of high carbon spring steel. Heat treated cast iron improves grain structure of pressure plates. Strong construction is Rockford's key to long and rugged service.

VIBRATION-FREE CLUTCHES OFFER SMOOTHER ENGAGEMENTS

Smooth engaging Rockford Clutches are vibration-free! Rockford Clutch eliminates vibration through dynamic and static balancing. Clutch vibration can ruin bearings and crack housings. Minimum inertias prevent gear clashing and delayed shifting.

PRECISE PRODUCTION MEANS PRECISE PERFORMANCE

Each Rockford Clutch component is precision built. Rotary surface grinding assures uniform thickness. Discs are checked carefully for dish and run-out. Inspectors check close tolerances for flatness by pressure and weight-drop drag machines.

If you need clutches for original equipment or for replacement, Rockford Clutch offers the highest quality in power control. From research to inspection, Rockford Clutches are designed and built for long, rugged and reliable service. Rockford offers an ultra-wide range of power controls for all industries. Write today for illustrated brochure.

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DIVISION
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CONSTRUCTION METHODS

Construction News in Pictures...



Plugging the Gap

Blocks of concrete rise as high as 115 ft above the rock floor of the Colorado River, but the towering 700-ft-high walls of the gorge still dwarf Glen Canyon Dam. Contractor Merritt-Chapman & Scott Corp. has placed 350,000 yd of concrete so far. Three cableways spanning the canyon place concrete supplied by a plant perched atop cliff at left.

Lifting Liner

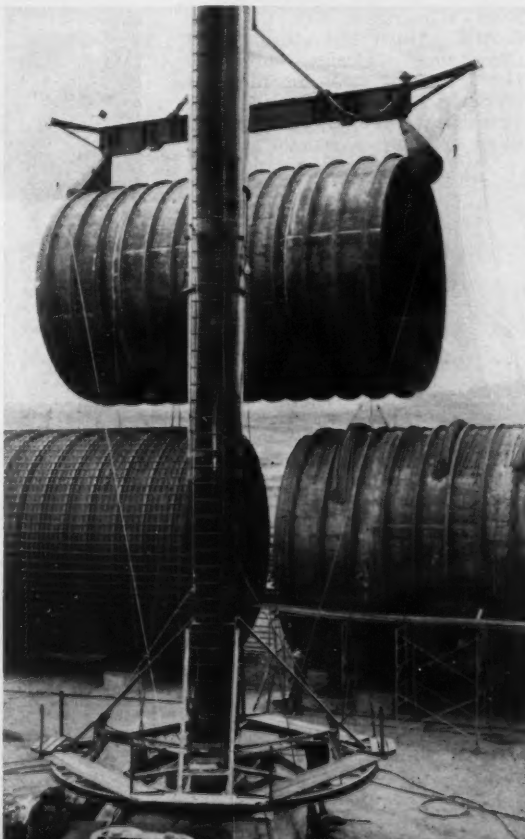
A 150-ton guy derrick with a 150-ft mast and 120-ft boom lifts 60-ton section that will line penstock at Oahe Dam. Typical liner sections are 40 ft long and 24 ft in dia. Consolidated Western Division of U. S. Steel Corp. is fabricating some 20,000 tons of plate steel into 449 liner sections at field plant at the site.

continued on next page



Feeding Forms

A paver feeds concrete into 20-ft-long steel bulkheads forming a section of a seawall at Galveston, Tex. Jumbo behind paver rides on rails to carry form sections from pour to pour. Supervised by the Corps of Engineers, Cage Bros. of San Antonio are building a 6,900-ft seawall extension to protect the city from hurricanes.





CONSTRUCTION NEWS IN PICTURES... *continued*

Placing Pipe

A 50-ton P&H crawler crane lowers 30-ton, 90-in. wye section during unloading operation while Bay City motor crane backs off on other end. Section will be placed in sheet-lined trench to form branch in circulating water discharge system at Riviera plant of Florida Power & Light Co., where Ebasco is building 600,000-kw extension.

Closing the Gap

Two stiffleg derricks near completion of steel erection on 2,293-ft, two-level trussed bridge over the Lake Washington Ship Canal at Seattle. Allied Structural Steel Companies, Chicago, fabricated 11,400 tons of steel for the \$13-million structure. Industrial Construction Co. of Minneapolis is handling erection of structural steel.



Runway Grading

A fleet of four International Pay-scrappers move earth for new 11,500-ft-long jet runway at Denver's Stapleton Airport. A TD-25 push-loader the rigs. Northwest Engineering Co. of Denver holds a \$1.9-million contract that calls for 4,100,000 yd of excavation. A 30-ft-high fill will carry the runway over a creek, a railroad and a highway.



BONE DRIED and BOTTOMED OUT IN JUST 10 DAYS



Lift Station No. 5, Pinellas Park, Fla.
Contractor: Atlas General Construction Co., Inc., Largo, Fla.
Engineers: Russell & Axon, St. Petersburg, Fla.

With a two-stage Moretrench Wellpoint System eliminating 22' of water, the contractor moved ahead rapidly in excavating this deep lift station to grade.

Fred O. Harrell, President of Atlas General Construction Co., Inc., writes us:

"I know that a great deal of our success with this project can be attributed to your equipment and the excellent service your firm has given us. We want you to know we appreciate your fine cooperation."

Cooperation . . . service . . . success — You can count on them all when you pump with Moretrench!

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It's New!

"EUC" S-24

- ▲ **MORE POWER** . . . 432 h.p. with GM 12V-71 engine.
- ▲ **MORE CAPACITY** . . . 24 yds. struck, 32 yds. heaped, 80,000 pound payload.
- ▲ **MORE WORK-ABILITY** . . . Torqmatic Drive with converter lock-up and splitter gear that matches power and speed to every job requirement.
- ▲ **MORE DEPENDABILITY** . . . job proved components and design features.
- ▲ **MORE SERVICE ACCESSIBILITY** . . . engineered for easy servicing and maintenance that cuts downtime.

HERE'S BIG NEWS for users of big scrapers! The new Euclid S-24, with payload capacity of 80,000 pounds and 24 yds. struck capacity (32 yds. heaped), is ready for your big yardage projects.

Powered by a 432 h.p. engine with Torqmatic Drive, this new "Euc" is 'way ahead of even the newest big single-engine scrapers. Have your dealer show why this S-24 belongs in your profit picture and can be your ace-in-the-hole for that next bid!

EUCLID Division of General Motors, Hudson, Ohio

Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland



EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE

EUCLID S-24

**OBSOLETE "NEWEST"
SINGLE-ENGINE
OVERHUNG SCRAPERS**

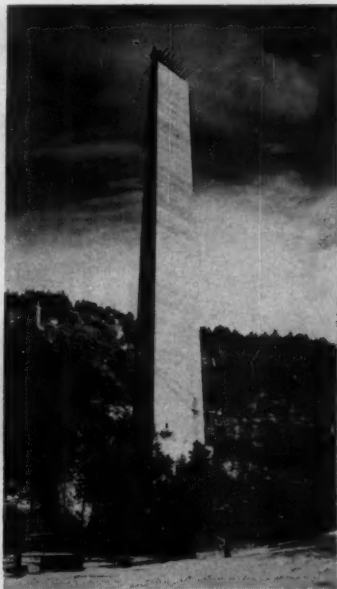


432 HP... 80,000 pound PAYLOAD

Construction 'Round the World

In Austria

One of the five hollow-core concrete piers that will support 2,155-ft box girder bridge over the Sill River near Innsbruck towers more than 600 ft above the ground. Vienna contractor Universale Hochund Tiefbau A. G. used German adaptation of slip forming method to build the piers. The bridge will be a major link in the new German-Italian superhighway.



In Iraq

A joint venture managed by Raymond International Inc. is building an 1,800-ft-long deep-water terminal for loading oil tankers in the Persian Gulf. Hydraulically operated legs support each of the two working platforms, which will become permanent parts of the structure. One holds a batch plant and building, the other a piledriver.

In Canada

Side-boom tractors hold limber 24-in. pipe aloft as Cat D7 installs in the trench a steel casing that will be pushed beneath road crossing to carry pipeline on its way from Alberta to Wisconsin. Bechtel Corp. completed a 155-mi portion of the 500-mi Midwestern Gas Transmission Co. pipeline with two spreads of big equipment in only 27 days.



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NEW CONCEPT in wire rope design

7-FLEX[®]

PATENT APPLIED FOR

Premium Whyte Strand IWRC

A true 7-strand wire rope
— 7 strands around an
independent wire rope core

7

6

5

4

3

2

1

There's no other wire rope like it! Macwhyte combines all desirable wire rope characteristics in a single ALL-PURPOSE rope!

We think you'll be as excited as we are about 7-FLEX! This is the kind of rope you've been hoping for. It's as flexible as an 8-strand rope—as rugged as 6 x 19—and resists fatigue like 6 x 37.

7-FLEX has 16 $\frac{2}{3}$ % more wearing surface than 6 strand rope. There is less unit pressure between rope and sheaves, so less rope and sheave wear. There is more sheave contact, less rope-creep. Result — longer rope life — less down time — lower operating costs!

The all-new 7-FLEX is a PREmium high-quality, high-strength PREformed and internally lubricated Macwhyte Rope.

You'll want to install this rope on equipment applications like these:

Crowd and hoist rope on
scraper wagons

Holding and closing lines
on clamshells

Shovel and drag line hoist ropes

Digging lines on small
excavators, trench hoes, etc.

Boom hoist lines on
excavating equipment

Hoist and swing lines on
dredges and derricks

Ask any Macwhyte distributor or write for bulletin 60100-R.

241A



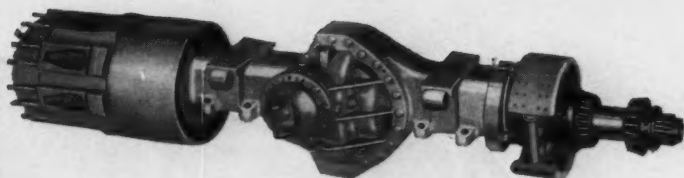
MACWHYTE Wire Rope **COMPANY**

2900 Fourteenth Avenue, Kenosha, Wisconsin, U.S.A.
Wire Rope Manufacturing Specialists Since 1896



NEW... MACK 30-TONNER

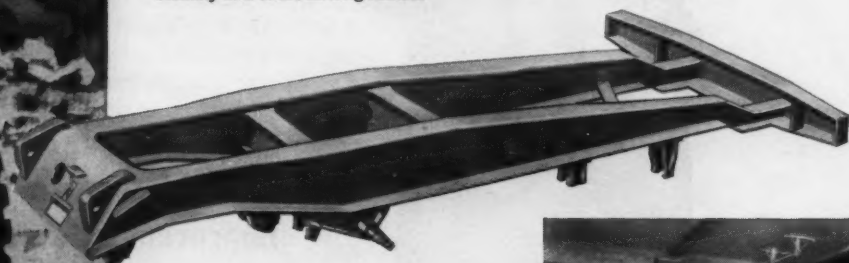
...designed to make your tough jobs easier



Heaviest-duty Mack rear axle, combining hypoid carrier with Planidrive®, keeps M-30X hustling where others bog down. The new M-30X boasts one of the strongest, longest-lived rear axles of any four-wheel dumper in the field. Drive is through exclusive single-reduction hypoid Mack carrier, with planetary gears in wheel hubs. Suspension is by extra long, extra broad semi-elliptic progressive-rate leaf springs with cam-faced slipper ends and radius rods.



New tubular front axle withstands heavier loadings. Steel tubing, seven inches in diameter, with walls $\frac{3}{4}$ " thick is welded to cast ends to provide a reversed Elliott front axle that withstands the most punishing loads of quarrying, construction or mining. Extra wide tread gives maximum stability and short turning radius.



Five-crossmember, alloy steel frame shrugs off jarring drop loads of big shovels. Typical of Mack off-highway truck construction practices, the frame of the M-30X Model is extra solid, extra strong. I-beam main rails are tied together by five welded crossmembers to prevent stress concentrations.

New, massive functional cab for easier truck handling...extra driver comfort. The M-30X cab is not only rugged, but completely functional. Offset design provides maximum vision for quicker spotting and dumping and safer operation. Forward position permits heavier loading of new set-back front axle.



Meet the new Mack four-wheel dumper chassis that meets the most challenging, rigorous, heavy-duty jobs in mining, quarrying and construction—the M Model 30-Ton Dumper.

Visually, the silhouette of the new M-30X exhibits efficient, modern lines that are unmistakably Mack from the new, spacious and functional cab to a rear axle that is one of the sturdiest and most trouble-free of any four-wheel dumper in the field.

Beneath visual ruggedness lie the time-proved features that have won Mack construction trucks worldwide fame for complete reliability and performance. In addition, there are many M Model exclusives that

make it even more maneuverable, rugged, dependable and safe.

Sure to be first choice among those who must haul huge tonnages profitably, the M Model is ready for your most critical appraisal. See your Mack branch or distributor for the full story of its capabilities. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.



MACK
FIRST NAME FOR
TRUCKS

0011



The powder-actuated tool shown here is a fundamental improvement over other methods of fastening to steel and concrete. Five years of extensive field experience have demonstrated that its fastenings are at least the equal of those made any other way. But it will make them faster, more economically, and with less effort required from your work force. It's called the Duo-Jobmaster and it's part of the Ramset Fastening System.

For immediate service, call your local Ramset dealer. He's listed under "Tools" in the Yellow Pages. For information write to: **Ramset Fastening System**

WINCHESTER-WESTERN DIVISION **Olin** 281-D Winchester Ave., New Haven 4, Conn.
Circle 84 on Reader Service Card

Overlooking the Obvious

CONTRACTOR FAILURES still are on the rise (p. 47) Nearly 17% of total business failures last year were in construction, yet the industry represented only 10% of the total business population. More importantly, total construction-failure liabilities for 1960 were more than 21% of the liabilities from all business failures.

These dismal facts were presented at the annual convention of the Associated General Contractors of America last month in Boston by George E. Keefe, vice president of Dun & Bradstreet. And he blamed overextension as the greatest single factor in failures. Contributing to this overextension is today's construction climate in which management problems are far more complex, and in which "never more intense" competition has driven down contractors' gross profit margins to "among the lowest in all industry."

All this is true, of course. But when you come right down to it, the basic cause of almost all failures is poor management.

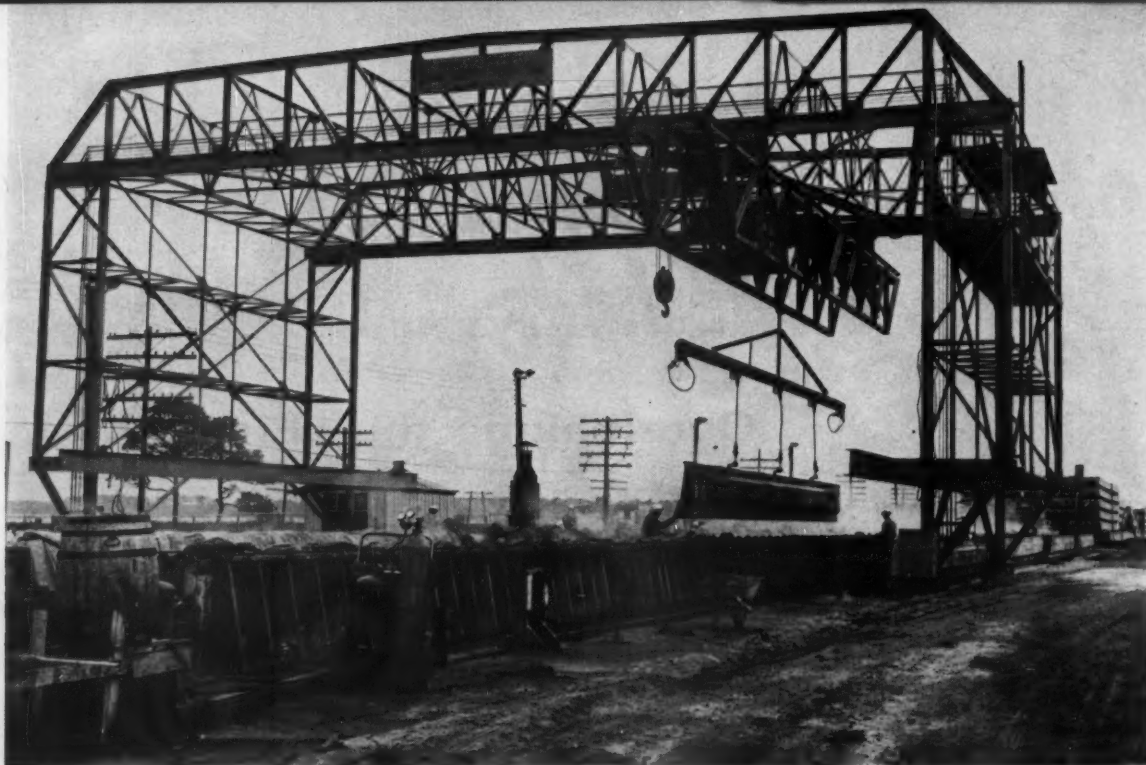
At the AGC meeting, Admiral E. J. Peltier, chief of the Navy's Bureau of Yards and Docks also accused contractors of poor management. "Too frequently," he said, "we see careful, imaginative designs botched by poorly supervised labor. We see expensive and superior materials ruined by exposure, careless handling, and unintelligent use. We see costly labor and equipment idled because of poor scheduling or lack of direction. Every one of these cases results from poor management."

"If only some of the skill of management—which reaches magnificent proportions when bargaining over the change-order table—if only some of this skill could be transported to and maintained at the job site 'till the job is done!'"

Naturally, skillful management will do all in its power to try to eliminate the poor practices cited by the admiral. But it must do more.

In the first place, it will bid only on those jobs it is competent to handle and will shy away from those that overextend its credit, know-how, or manpower resources. It will insist on accurate cost records so reasonable bids, including a reasonable profit, can be submitted. It will know exactly what it is committing itself to do when it signs the contract. It will be alert to take every advantage of new construction techniques, machinery, and materials. It will set up—and follow through on—effective programs for accident prevention and equipment maintenance.

These are only some of the obvious prudent practices of good contracting management. But obviously they were not obvious to those contractors who failed or to the incipient bankrupts kept alive by friendly creditors or sureties. Overlooking the obvious can lead to ruin.



A WORKHORSE—Hydraulically operated 40-ton gantry spans 60 ft. It's used for forming and stripping and pouring concrete. It also stockpiles finished bridge members at one end of the prestress yard, then loads them into barges for transportation to the bridge site.

On-Site Casting Yard Mass Produces Prestressed Piles and Beams

Most of the tools and equipment used in this casting yard have been specially designed or modified to suit the contractor's operation. The prestressed concrete members will go into a bridge at Biloxi, Miss. It requires 128,000 lin ft of piles and 1,512 52-ft-long beams.

MASS PRODUCTION techniques and specially built equipment are saving valuable time for a contractor who must cast more than 200,000 lin ft of prestressed concrete members for a bridge at Biloxi, Miss.

The 7,600-ft-long bridge will rest on square precast, prestressed concrete piles topped with concrete pier caps. Precast, prestressed beams spanning 52 ft between piers will carry a four-lane roadway. It will take 26,000 yd of concrete to cast 1,512 beams and 128,000 lin ft of piles for the bridge.

The contractor, J. B. Michael & Co., Inc., Memphis, Tenn., set up his prestress yard near the job site to keep transportation and handling to a minimum. The yard includes a casting bed and a dry batch concrete plant. A 1,000-ft railroad spur and a dock were built to serve the site.

Seven lanes make up the casting bed. Three 330-ft-long lanes are used for casting beams, and four 465-ft lanes are used for piles. A gantry handles forming and stripping, places concrete with a specially built bucket,



THE CASTING BED—Seven lanes make up the prestress bed. Three 330-ft-long lanes are for casting beams, and four 465-ft-long lanes are used for casting four sizes of piles.

stockpiles the beams and piles, and loads them into barges for transportation to the bridge site.

The hydraulically powered gantry was built for this job by Dixie Form & Steel Co. of San Antonio, Tex. The gantry spans 60 ft and can lift and carry 40 tons. This is just enough capacity to lift the biggest piles, which weigh 40 tons apiece. The beams weigh 12 tons each.

A Cat D6 tractor with a winch also works in the prestress yard. The winch helps place tensioning strands, ties, and end plates for columns and beams. As the strands come off the reels at one end of the casting bed, they are threaded through end plates and ties and pulled into place by the tractor-mounted winch. Then a crew positions the various components in the casting bed.

Prestressing follows. A three-man team tensions the strands using the single-strand jacking method. A hand-operated chain hoist moves the jack from strand to strand. The hoist rides on an overhead wide-flange beam at the end of the casting bed.

All hydraulic equipment for

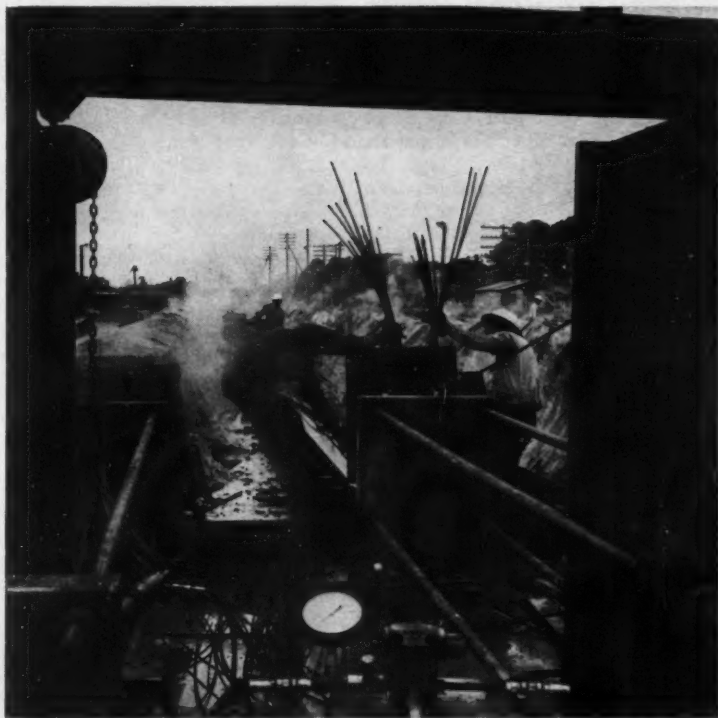
prestressing was supplied by Joe Stein of Houston, Tex. The system includes a low-pressure, high-volume pump in tandem with a high-pressure, low-volume pump. It is driven by a 15-hp electric motor. Maximum hydraulic pressure is 5,000 psi.

Hot Oil Speeds Jacking

To increase production, the contractor boosted pumping capacity by adding a small oil heating unit to the reservoir. The heater maintains the oil temperature at 120 to 140 deg. Because hot oil is less viscous pumping efficiency is increased and jacking time reduced.

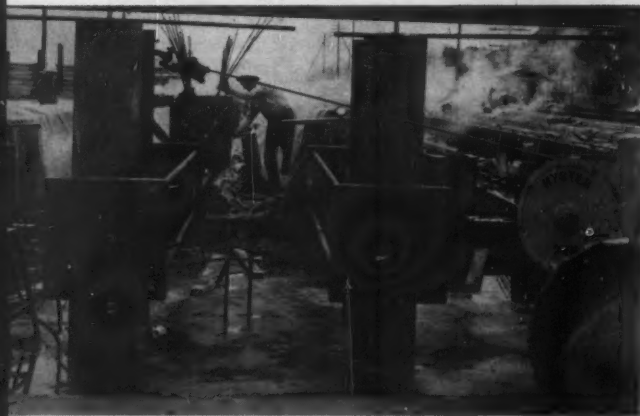
Before the heating system was installed it took about 2 hr to tension 31 strands for a beam. With hot oil, it takes only 1 hr, and cold weather does not affect the operation.

The heater has a resistance-type electrical heating element and a thermostatic control. Flash point of the oil is about 500 deg. To prevent fire, the heating element must be kept completely submerged in oil. A float-actuated control system was installed to protect the equipment. The float shuts off the



PRODUCTION—Workers guide prestress strands, ties, and end plates into place on a casting lane. All steel and accessories for a beam or pile are placed in a single operation.

Winches and Hoists Simplify Prestress Work



WINCH PULLS STRANDS—

Hyster winch on a Caterpillar D6 tractor pulls prestressing strands, ties, and steel end plates into place as workers position them along the beds.

HOIST MOVES JACKS —

Hand-operated hoist riding on overhead wide-flange beam lifts the prestressing jacks from strand to strand. Single-strand jacking is used on this project.



heater and turns on a warning light if the oil level drops. A thermometer gives a visual check on the unit's operation at all times.

Preassembled Forms Save Time

Steel forms for beams and piles were built by Plant City Steel Corp., Tampa, Fla. Form panels are 10 ft long and 24 in. high. To simplify handling, eight of them are bolted end to end and moved as a unit.

Piles for this job are of four different sizes: 20x20, 24x24, 30x30, and 36x36 in. The 24-in. height of the form panels is adequate for the 20 and 24-in. piles. For larger sizes, a special 12-in.-high section is bolted to the bottom of each form panel. The resulting 36-in.-high forms also are handled in 80-ft lengths.

When the form panels are in place, two crews install ties and clips along the bottom of the forms and spreaders along the tops. The ties hold the side panels firmly against the sides of the bottom form, and the spreaders maintain the correct distance between tops of the side forms.

The ties are threaded rods held in place by steel clips that fit on the bottom flanges of the forms. The rods are passed through holes

in the clips and secured in place with a nut tightened by an impact wrench.

Spreaders along the tops of the forms act either in tension or compression. The spreaders are made of pipe; each end is fitted with a short steel rod that is inserted in holes in the top flanges of the side forms. If the forms are out of line, the crew pulls them together with a come-along so the spreaders can be installed.

Pipe collars at 45 deg are attached to the spreader bars. Hold-down rods inserted in the collars keep cylindrical cardboard void forms in place during concreting.

Gantry Places Concrete

A specially fabricated 5-yd bucket suspended from the gantry pours all concrete. The gantry is used for concreting because it moves the bucket along the forms in a continuous operation. It discharges its 5-yd load faster than a truck mixer could pour that quantity. The bucket's discharge opening is narrow to keep concrete from spilling over the sides of the forms. A lever-operated clam-type gate controls the flow of concrete.

The mix is designed for a 5,000-psi ultimate strength. Prestress

strength is 4,000 psi. Pozzolitic retarder and 4% air entrainment are used in the concrete.

Trucks with 6-yd Worthington mixers haul concrete to the prestress yard from a Johnson dry batch plant. The mixers are equipped with burlap flaps that were installed by the contractor to keep the outside of the drums clean. The flaps, hung from a bar above each mixing drum, are soaked in oil. As a drum rotates, the oil-soaked burlap wipes off dirt to keep it from sticking.

It takes J. B. Michael an average of 10 hr to set up and pour the piles or beams in one lane.

When the time comes to strip the forms, the gantry picks up each 80-ft section and places it on the side of the casting bed. To keep a form from falling on its side, it is attached to special pipe posts with chains and hooks. These hold the forms in a vertical position for easy cleaning.

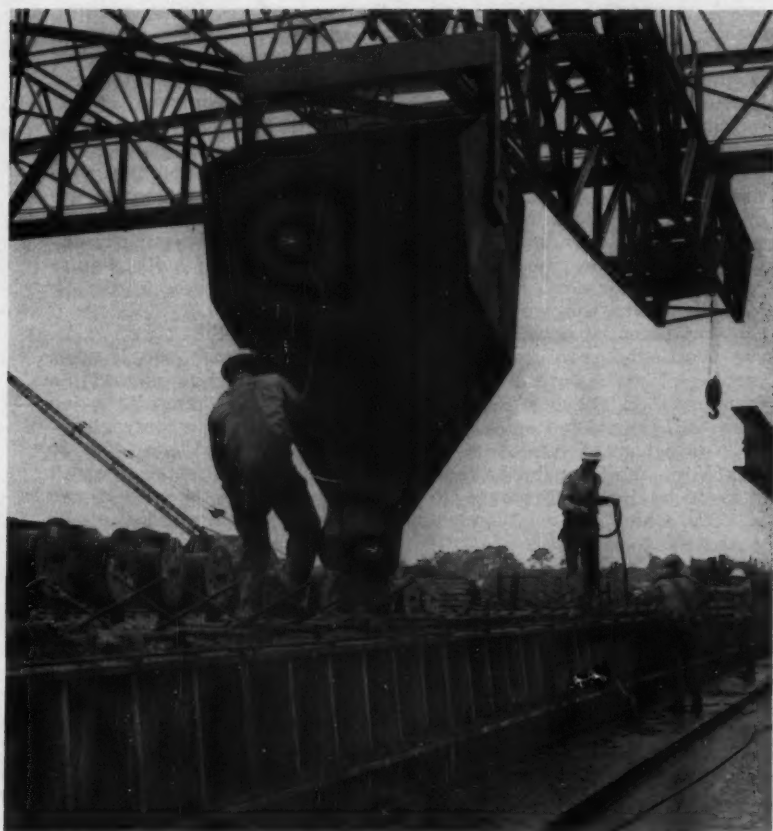
Project manager of the bridge job is J. B. Michael, president of the company. F. M. McCool, project engineer, was in charge of setting up the prestress yard. Herbert Johnston is prestress superintendent. Project engineer for the State of Mississippi Highway Dept. is B. Markette.



SPREADERS — Two-man team installs spreaders along the tops of the forms to maintain the correct distance between panels on opposite sides of the members.



TIES—Threaded steel rods are fitted with nuts to hold the side panels flush against the bottom forms. Clips that fit on the flanges of the forms hold the rods in place.



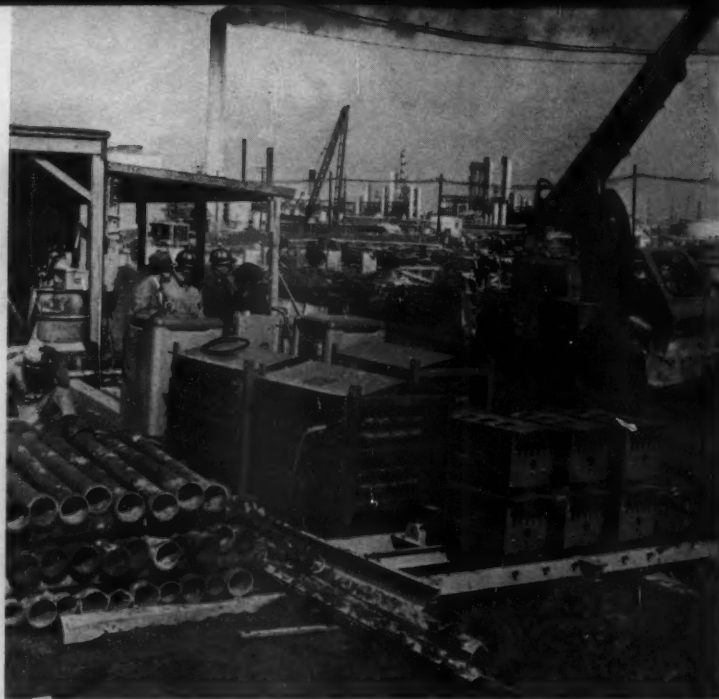
SPECIAL BUCKET—Gantry pours concrete with specially fabricated 5-yd bucket that is equipped with a lever-operated, clam-type gate that controls the concrete.



FORM ANCHORS—Pipe stanchions along the sides of the casting bed are equipped with chains and hooks that hold the forms in a vertical position during cleaning.

ON THE JOB—The portable welding unit, when connected to a 440-v ac power supply, serves up to 24 operators during pipe and steel erection and field fabrication.

A portable, constant-potential, multiple-arc welding unit designed by The Lummus Co. to serve 24 operators is reducing transportation costs, set-up time, and job-site congestion on projects where extensive welding is necessary.



Multiple-Arc Welder Saves

TWENTY-FOUR WELDERS served by a central power source started work on a chemical plant construction project last month, only a few hours after the equipment arrived at the job site. The welding power source is a multiple-arc, constant-potential system especially designed for projects where extensive welding is necessary.

The system was developed and assembled by The Lummus Co. of New York. On their job at North Claymont, Del., it is handling steel and pipe erection, field fabrication, and stud welding.

During the past two decades shipyards have applied the multiple-arc welding concept using motor generators, but only recently has the multiple-arc principle been applied with rectification. Power house construction projects also have utilized multiple-arc welding, but the systems are not portable. They are installed in the structures during construction and left behind when the work is completed.

Lummus' welder is compact and portable. It consists of two 500-amp power sources, three 295-amp six-man resistor stations, six 295-amp one-man resistor stations, a dc distributor

panel, connections, cables and reels.

The entire 40-in.-high unit is mounted on an 8x12-ft frame. It weighs only 4,000 lb. The welding system saves storage space, cuts down crating and transportation costs, reduces job site congestion, keeps original investment to a minimum, and simplifies maintenance.

All components are standard pieces of equipment manufactured by others. The two 500-amp constant-potential power sources are Westinghouse silicon diode rectifiers. The resistor stations are made by C. H. Stevens & Co., of Cornwall, Conn., and sold by J. B. Nottingham & Co., Inc., of New York. The distributor panel is made by Hobart Brothers Co. of Troy, Ohio.

According to Lummus' estimates, the multiple-arc system requires a smaller original investment than single-arc power sources of equivalent capacity. Based on average list prices, the 24-man welding system costs \$8,012. With three-phase rectifier-type dc arc welders, a system with 24 single-arc power sources would cost about \$15,000.

Lummus also compared the time needed for maintenance of

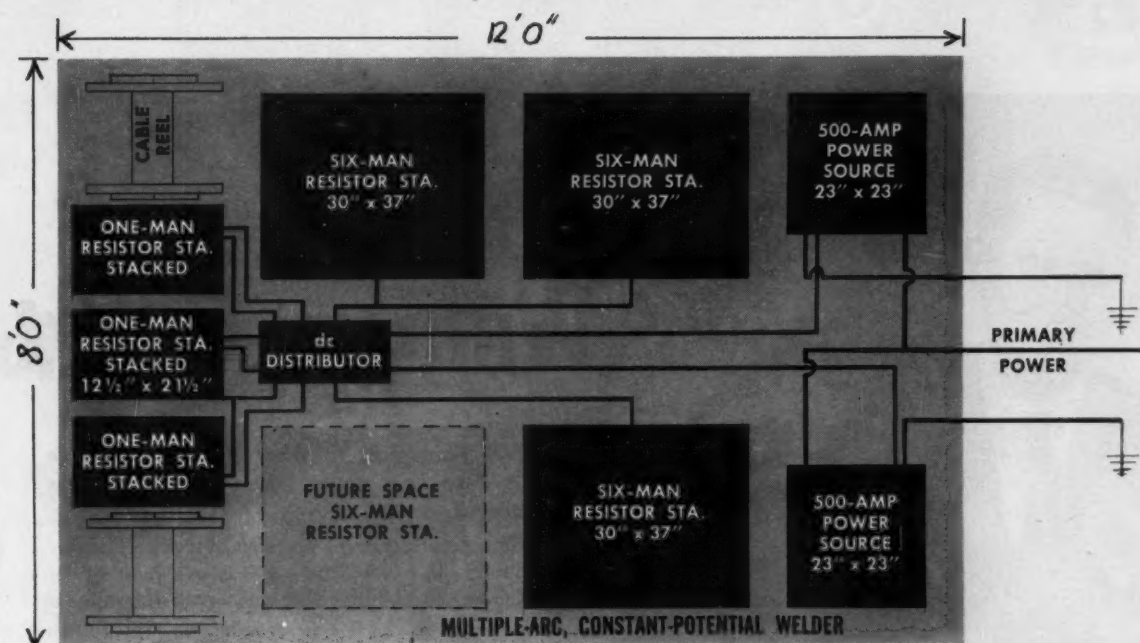
the two systems. On an average, a single-arc welder requires about 15 min of maintenance per month. On this basis, a 24-man welding system composed of single-arc units would need 72 hr of maintenance per year.

In the constant-potential system, the two power sources are the only components with moving parts that need regular attention. This system will require 6 hr of maintenance per year.

Short Set-up Time

Operation is easy, too. It takes only a few hours to connect the base unit for welding. At a job site, it is placed in a central location and connected to a 440-v ac power supply. As soon as the unit is energized, all 24 welders can start work within a radius of 300 ft from the ac power supply.

Each man has only 100 ft of welding cable, but components of the system can be moved away from the base unit to increase the working area. Each one-man resistor station can be located close to the actual work site to avoid numerous trips for adjusting the amperage. And the six-man resistor stations can be positioned 100 ft away from the base unit to increase the welders' range.



COMPACT WELDER—All components of the welding unit are mounted on an 8x12-ft skid frame for easy handling and shipping. The 40-in.-high unit weighs 4,000 lb.

Time and Space

If extensive welding is necessary in confined locations, the welding unit is positioned in an open area and distribution boxes are installed near the work. This is especially handy for welding structures above or below ground level because only a small piece of equipment must be moved—not the entire welding machine. Also, job site congestion is reduced because a single cable serves an entire welding crew.

In designing the system and sizing the components, Lumus analyzed welding duty cycles for stick electrodes. A welding duty cycle is the ratio of actual arc time to the total time equipment is energized and available for welding. In the construction industry, a welding duty cycle averages about 25%.

Lummus' engineers also noted that all welders served by one power source are not welding at the same time. This enables one power source to serve more operators. The distribution of the welding load is known as the diversity factor and it was considered in designing the system.

The power source can carry an overload for 2 min. Because it takes less than 90 sec to burn off an electrode, an overload situa-

tion will be corrected well within the 2-min period.

As a safety precaution, the welding system is equipped with an overload trip that takes the power source off the line without damage in case too many operators attempt to strike an arc at the same time.

Variety of Applications

The welding unit can be adapted to different types of welding and different capacity requirements. The two power sources can be connected in parallel to produce 1,000 amp for welding Nelson studs. Making this connection is easy because the power sources do not have to be synchronized; with single-arc units synchronization can be troublesome.

Lummus also plans to use the multiple-arc system for gouging and working with carbon arcs and automatic welding installations. For these applications, the number of welding operators has to be reduced or equipment must be modified. If 24 operators are needed, the capacity of the power source must be increased.

This is an easy operation because provision has been made to substitute power sources to in-

crease the unit's capacity to 1,500 amp. Also, an additional six-man resistor station can be installed so that the system can serve 30 welders when equipped with a power source of proper capacity.

In some applications, this system can operate at a 50% welding duty cycle. An example is field fabrication of steel. In this case the 500-amp multiple-arc system serves 15 welding operators.

As additional welding systems of this type are built, the capacity and the number of welders served can be changed simply by installing the proper components. According to Tommy Leighton, Lummus' welding specialist, the next unit will be even more compact than the first one. It will be 4 ft wide, 6 ft long, and 5 ft high. Resistor stations will be stacked, and the power sources will be placed back to back. This is expected to save space and reduce transportation costs even further.

Lummus spent about six months in preliminary investigations on this welding system and took about four months to build the actual unit. The work was done at Lummus' Engineering Development Center in Newark, N.J., under the direction of L. B. Glaser and E. J. Wohadlo.



W. P. YAMARICK

Q. & A.

With an Expert

● From the contractor's point of view, what are the advantages and disadvantages of producing concrete for paving from a central-mix plant? To

get the answers, *Construction Methods* interviewed W. P. Yamarick, chief engineer of C. F. Replogle Co. of Circleville, Ohio. His answers detail the experience of a leading construction firm that has used central mix on jobs throughout Ohio—the state that led in the development and acceptance of central-mix techniques.

Q. Mr. Yamarick, to what do you attribute the sudden upsurge of interest in central-mix concrete?

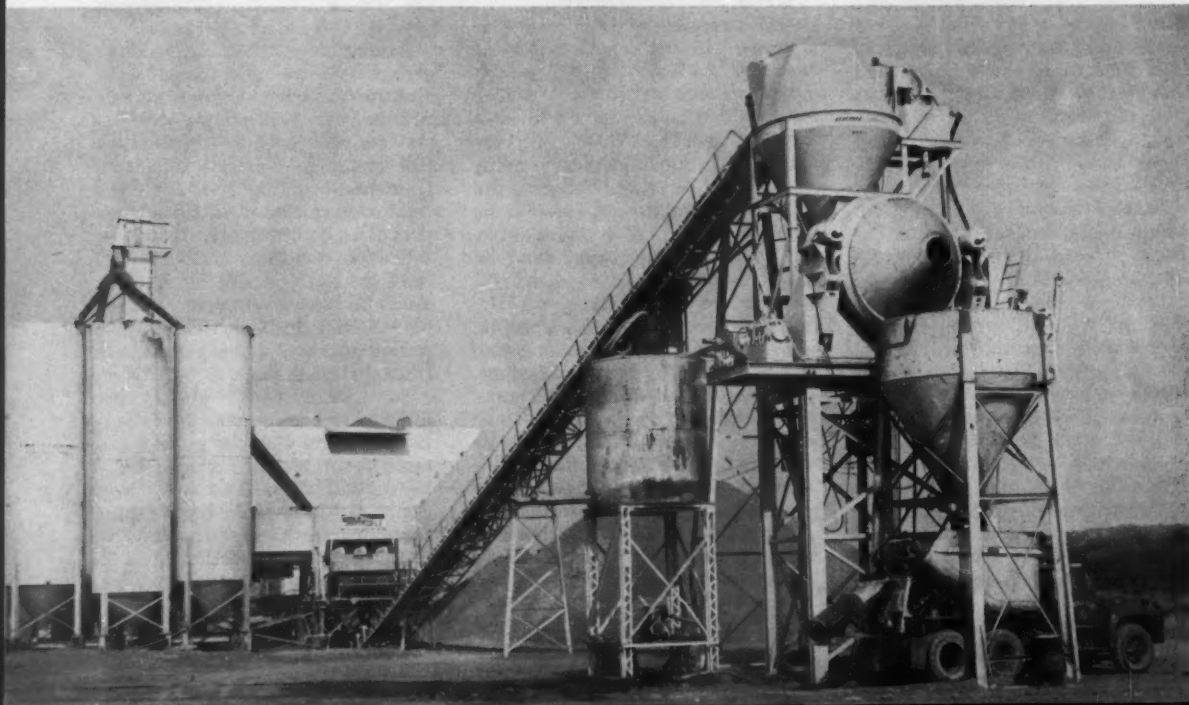
A. To a great extent it's the result of modern highway design. Complex interchanges and intersections call for variable-width lanes, dog legs, tapered sections, and intricate approaches. This is generally low production work that requires a lot of hand labor to pour and finish. It isn't uncommon to work at 10 or 15 locations.

In this kind of situation, a paver on the grade doesn't always permit the contractor to get the most out of his plant. Delays in moving pavers from one location to another cut into the plant's production time. One other thing. Pavers aren't always suitable in areas where working room is restricted. There's just too much equipment needed at the pour.

Q. How does central mix get around these problems?

A. Mainly with maneuverable trucks. Since proportioning and mixing takes place at a central plant, hauling

CENTRAL-MIX PLANT—Replogle's 8-cu-yd central-mix facility produces up to 240 yd per hr on an average 90-sec mixing cycle.



on Central-Mix Paving

units can deliver the mixed concrete to the pouring site. This delivery spread gives the contractor the versatility he needs to pour at many locations at the same time.

Q. Would you say the substitution of hauling trucks for pavers represents the only advantage of central mix?

A. Not at all. By locating batching and mixing facilities at a central location, the contractor creates conditions favorable to plant automation. This allows more rigid quality control without the delays of manual operation. I would say it's possible to get an improved product with less labor from a central-mix plant. As a bonus, the contractor also needs fewer qualified inspectors to administer a centrally located operation.

Of course, quantity as well as quality is affected. By adding more mixers, the plant can yield as much concrete as the hauling units can handle. Since congestion at the pouring site is no longer a factor, only the imagination of the contractor in building the plant and the engineer in designing the project will control the ultimate capacity of the plant.

Q. Are plant and hauling units the two main financial considerations for a contractor who is thinking about investing in a central-mix operation?

A. That's right. It's reasonable to assume that finishing equipment is comparable in cost regardless of the paving method used.

Q. What about hauling units? How do wet-batch units compare with dry-batch trucks?

A. In general, the contractor needs a smaller number of slightly more expensive hauling units for a central-mix paving operation. The additional initial cost results from the use of specially designed, single-purpose bodies. The smaller number results from the reduction in waiting time at the plant for loading and at the pouring site for discharging. For example, our statistics show that it takes between 1½ and 1¾ min to load and discharge a 6-yd concrete hauling unit. It takes the same amount of time for 1 1/3-yd dry batch to be weighed at the plant and dumped into the skip of a paver.

However, from an investment standpoint, the con-



BIG INVESTMENT—Special hauling units require big outlays.

tractor considering a central plant is faced with additional outlays for hauling units. In a paver operation, batch trucks generally are available on a rental basis. At an average cost of \$15,000 each for 10 to 15 hauling units, a contractor has to do some hard figuring to justify an investment of this magnitude.

Q. What are the factors that justify such an investment?

A. Availability of cash is certainly one. Then, too, the contractor has to think about the continuity of work so that he can distribute the fixed costs of interest and depreciation over a number of jobs. After that, the contractor should analyze his available projects to make sure that haul requirements are similar so that a base number of trucks can be acquired to handle plant production efficiently. Occasionally, the full capacity of the plant may not be realized on long hauls because it would be too costly to buy extra trucks for the few days needed to pour out the long-haul yardage. In this respect, the dry-batch hauler has the advantage because he can easily add trucks for a short period on a rental basis.

Q. How about plant investment? Do you have any comparative production figures?

A. The production available from a paver or a central plant is largely dependent upon required mixing time. Tests conducted here in Ohio seem to prove once and for all that mixing time is not a factor of drum size or

Q&A with an Expert . . .

batch size. Therefore, for the purpose of comparison, one 8-cu-yd mixer operating on a 2-min cycle yields the same as two and a fraction dual-drum pavers working on a 60-sec mixing time.

Q. What about the total costs of these two setups?

A. A comparative analysis we made at Replogle for our own requirements indicated that the initial investment per cu yd would be somewhere between 1/2 to 1/3 less for central mix. However, this doesn't follow where commercial power isn't available and portable generators must be used to operate the electric drives of the central plant. In this case, initial cost would be about the same.

Q. So far you've only taken mixers into account. How about batching equipment?

A. As far as batching equipment is concerned, the cost of bins and weighing facilities for both types of installations are similar. An appreciable savings does occur in a central plant installation where municipal or suitable stream water is available and can be piped directly to the mixer. This arrangement is rarely suitable for a paver operation.

Q. What kind of production do you get out of your 8-cu-yd plant?

A. A fully automatic 8-cu-yd plant is capable of producing 240 yd per hr when operating on a 90-sec mixing cycle. When operating at 100% efficiency, two 34E dual-drum pavers can produce 240 yd per hr on a 1-min cycle. But it's pertinent to realize that theoretical production of 240 yd per hr is highly optimistic for the pavers, but not for the central plant. Probable paver production is less than 200 yd per hr. In addition, we find that maintenance costs and the obsolescence factor are far more favorable to central plant than pavers.

Q. Is there a handy formula that a contractor can apply to determine the advisability of central mix for him?

A. I'm afraid not. The economics of investment must be reviewed on an individual basis. The contractor has to take into account his operational program, the type of projects available in his bidding area, and the location of projects that may or may not have available commercial supplies of power and water.

Q. Let's say a contractor settles on a central-mix plant. What kind of a site does he need for the installation?

A. That depends upon the size of the plant, of course.

INITIAL INVESTMENT—

Central-Mix Plant VS.

Before plunging into central-mix concrete production in a big way 3 yr ago, C. F. Replogle Co. made the following comparative analysis, based on its own requirements:

Central-Mix Plant (fully automatic, portable, 8-cu-yd capacity, capable of producing 240 cu yd per hr when operating on a 90-sec mixing cycle)

- | | |
|---|-----------|
| 1. Mixer drum (8-yd capacity) complete with base and holding hopper | \$ 40,000 |
| 2. 36-in. conveyor | 20,000 |
| 3. Automatic batch bins, cement silos, etc. | 60,000 |
| 4. Generator (300kv) and accessories, assembled by the contractor | 30,000 |

Total Estimated Cost \$150,000

Generally, a four-acre site for aggregate stockpiles and plant is about right. If possible, a sloping terrain or even a side-hill arrangement is best. It provides drainage and even more important, a difference in elevation between batcher and drum so that the conveyor does not have too steep an incline. The mixer drum must be set high enough to discharge into trucks and even higher to load a holding hopper.

Q. You indicate that a central-mix plant has a more favorable maintenance factor than a paver spread. How do you account for this?

A. The central-mix plant presents a different maintenance problem because all drives and controls are electrical. Such things as sealed, explosion-proof motors and control panels enclosed in dust-proof panels result in availability ratings of 95% or better. Naturally, this high degree of performance can be insured only through the training of competent mechanics and electricians. An effective preventive maintenance program is vital. Of course, a breakdown in plant means a complete work stoppage whereas in a multiple paver spread the failure of one paver won't cripple the whole operation.

Q. What's the best way to handle plant breakdowns?

A. A mobile radio installation is almost mandatory to permit close contact between plant and pouring site.

Dual-Drum Paver Plant

This analysis covers initial investment only. Other factors that have a bearing on the economics of central-mix plants include the availability of water, power, and hauling units.

Dual-Drum Paver Plant (two 34E pavers, batch plant and two water trucks, capable of producing 240 cu yd per hr on a 1-min mixing cycle when working at 100% efficiency. Probable actual production is less than 200 cu yd per hr.)

1. Two 34E dual-drum pavers	\$100,000
2. Batch plant—three stop	55,000
3. Two water trucks	15,000

Total Estimated Cost \$170,000

A breakdown might occur when upwards of 100 yd is mixed and it must either be placed or wasted. A 5 or 10-min delay in notifying the plant might add another 25 yd to handle. On the other hand, this surge of mixed concrete can be used to good advantage during certain breakdowns since there is usually sufficient concrete on the way to grade to pour to a bulkhead.

Q. Do you have any preference on the use of agitating or non-agitating bodies?

A. That depends upon specific requirements. Agitation lends itself to certain urban hauls, particularly those needing extended travel time. However, these considerations are largely academic. Extensive tests confirm the acceptability of both methods. Many contractors prefer the non-agitating units because of lower initial and operating costs. No detrimental effects have been experienced in transporting concrete in non-agitating units on paving projects in Ohio. Hauls in excess of 5 mi are uncommon, but in certain instances 10 and 12-mi distances have been covered acceptably.

Q. Is there some way to insure thorough and rapid discharge at the grade?

A. Bodies should be cleaned after each shift. For faster and safer pouring, discharge should take place on the driver's side.

Q. Is there anything unusual about the equipment needed for placing and finishing central-mix concrete?

A. The placing of concrete in the forms with a 24x28-ft box-type spreader has proved satisfactory. The box or hopper has a discharge gate that allows the concrete to flow on the grade. And it's large enough to receive the full yardage of a hauling unit. The hopper travels back and forth across the grade from one form to the other, depositing concrete evenly to the correct depth. When depositing bottom-course concrete, the spreader has a capacity of 150 to 180 yd per hr. Where mesh is required, the top lift can be placed with a second box spreader or by backing up the first one. The remaining finishing operations are handled conventionally.

Q. Does this type of spreader require special forms?

A. Because the combined weight of the spreader and concrete is considerable, it is advisable to use heavy-duty forms to minimize deflection. Special care must be taken on elevated sections to make sure that form pins penetrate the subgrade deeply enough to prevent the spreader from overturning the forms.

Q. Can conventional screw spreaders be used in this operation?

A. For half-width paving, concrete can be dumped on the subgrade and spread with a conventional screw spreader. But for full-width paving, it is desirable to place concrete by other means. As yet, auger or paddle spreaders are not available to transfer concrete 18 to 20 ft at a rate fast enough to keep pace with the production of a central plant.

Q. Can you take a look into your crystal ball and tell us what developments in central-mix paving you foresee?

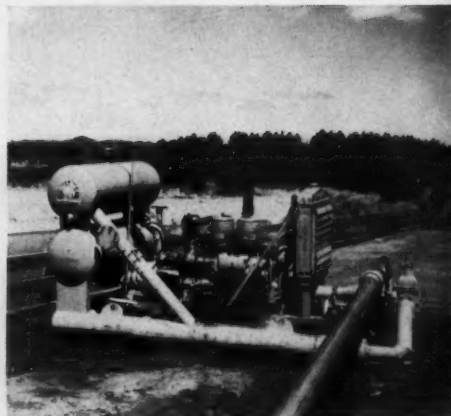
A. I think fully automatic batching from a central station will be commonplace pretty soon. Electrical controls will conduct every phase of the batching operation. Instruments that will compensate for moisture variations in the aggregate in each batch will confine uniformity within minute tolerances.

Significant progress is also being made in side-discharge dump bodies that will handle concrete of minimum slump. These are non-agitating bodies that rotate as units about center shafts parallel to the chassis. They do away with collecting chutes and allow concrete to be poured rapidly from the full length of a body directly into a spreader.

Turbine mixers are being developed now. Their compactness will lower plant height, making plants more portable and cheaper to construct. They may also reduce mixing time. These are just a few of the innovations on the way.



CUSTOM LOADING—At the quarry, about 20 mi from job site, a Bucyrus-Erie 71B equipped with McAffey tongs loads rock that will go into jetty unto tandem flatbed trucks.



HARD WORKER—Cornell pump works 16-hr day to feed water to the haul road.

Sand Haul Road Supports Trucks

A 3-MI LONG access road of water-soaked sand supports heavy tandem-body trucks that will carry a total of 235,000 tons of big rock for a jetty repair project at the mouth of the Columbia River in Oregon.

To keep the access road watered down, Donald M. Drake Construction Co. of Portland installed more than 30,000 ft of aluminum pipe along the route. A single 6-in. pump delivers water through the system to sprinklers that wet down the sand road at frequent intervals.

It was no trick at all to bulldoze a road for 3 mi through sand dunes in an area with very little grade. The road begins at the end of a hard-surfaced road that leads to a quarry and continues across the sand to the jetty site. Except for two 4% curves, the access road is straight as an arrow.

The pump, a 6-in. Cornell unit

powered by a GMC diesel, gets water from a small fresh-water lake. Working 16 hr a day, it pumps 27,000 gph at a pipeline pressure of 145 psi.

A 16,000-ft-long 6-in. aluminum supply line runs parallel to the road and feeds a 4-in. distributing line equipped with sprinklers.

Valves Control Water Flow

The 4-in. feeder line is divided into eight sections ranging from 1,500 to 1,800 ft in length. Each section is equipped with a separate turn-off valve that is opened eight times for 1 hr during a 16-hr shift. A stand-by pump is available in case the main pump fails.

The pipeline is supplemented by a tank truck that operates over the road at regular intervals. A grader blades the road to keep it smooth, and it also tows a road

roller to help compact the sand.

The road easily supports 60-ft-long tandem trucks that are hauling loads weighing as much as 25 tons. Under ideal conditions, trucks make as many as 60 trips a day over the compacted sand access road. The 25-ton load limit, incidentally, was determined by local laws governing loads over hard-surfaced roads and streets. In the contractor's opinion, the sand access road could support much heavier trucks.

Stone for the jetty project is quarried at a site about 20 mi from the job. Three sizes of rock—A, B, and C—are required. The heaviest type A boulder handled to date weighed 28 tons, and the average runs between 18 and 20 tons. They are hauled to the dump site by White trucks with tandem flatbed bodies.

Large-size rocks are loaded on the flatbeds by a Bucyrus-Erie 71

It's tough enough to transport 25-ton loads of big boulders over 17 mi of city roads. But Drake Construction Co.'s biggest problem is to get the rock the remaining 3 mi over sand dunes to jetties that the contractor is repairing. Drake's answer was to doze a road through the dunes, then keep it watered down with a sprinkler-equipped pipeline system.



SAND HAUL ROAD—Aluminum pipeline system with sprinklers runs parallel to 3-mi-long sand road.



BODY AND ALL—At the dump site, a Manitowoc 4500 with 90-ft boom and pipe spreader bar picks rock body off chassis of White truck.

Carrying 25-Ton Loads

B crane equipped with heavy-duty McAffey tongs. Smaller class B and C rock is loaded into conventional rock bodies by shovels and tractor loaders.

Rock Bodies Are Removable

The tandem rock bodies that haul the smaller B and C rock were modified so that a heavy-duty crane equipped with a spreader bar can lift a loaded body off the chassis, dump it, and return it quickly to the truck chassis at the dump site.

The big-capacity crane at the dump site is a model 4500 Manitowoc powered by a 600-hp, 12-cylinder Cummins diesel. It carries a 90-ft boom and has a rated capacity of 100 tons.

The spreader bar carried by the crane is made from 4-in. pipe that is as long as the truck boxes. Two chokers suspended from each end of the spreader bar have terminal

hooks that engage shackles welded to the truck boxes.

This system of dumping eliminated the need for building a ramp that would permit the trucks to reach the top of the jetty to unload. On this job, it would have been almost impossible.

Tongs Handle Big Rock

The McAffey tongs also come in handy when the large type A boulders are placed on the jetty. The Manitowoc, fitted with the tongs, simply picks them up off the flatbed bodies and swings them into position.

Drake is working under a \$1,327,000 Corps of Engineers contract that specifies a 10-month time limit for completion of the work. The project was started last fall, but work had to be stopped during the worst of the winter weather. It will continue this spring.

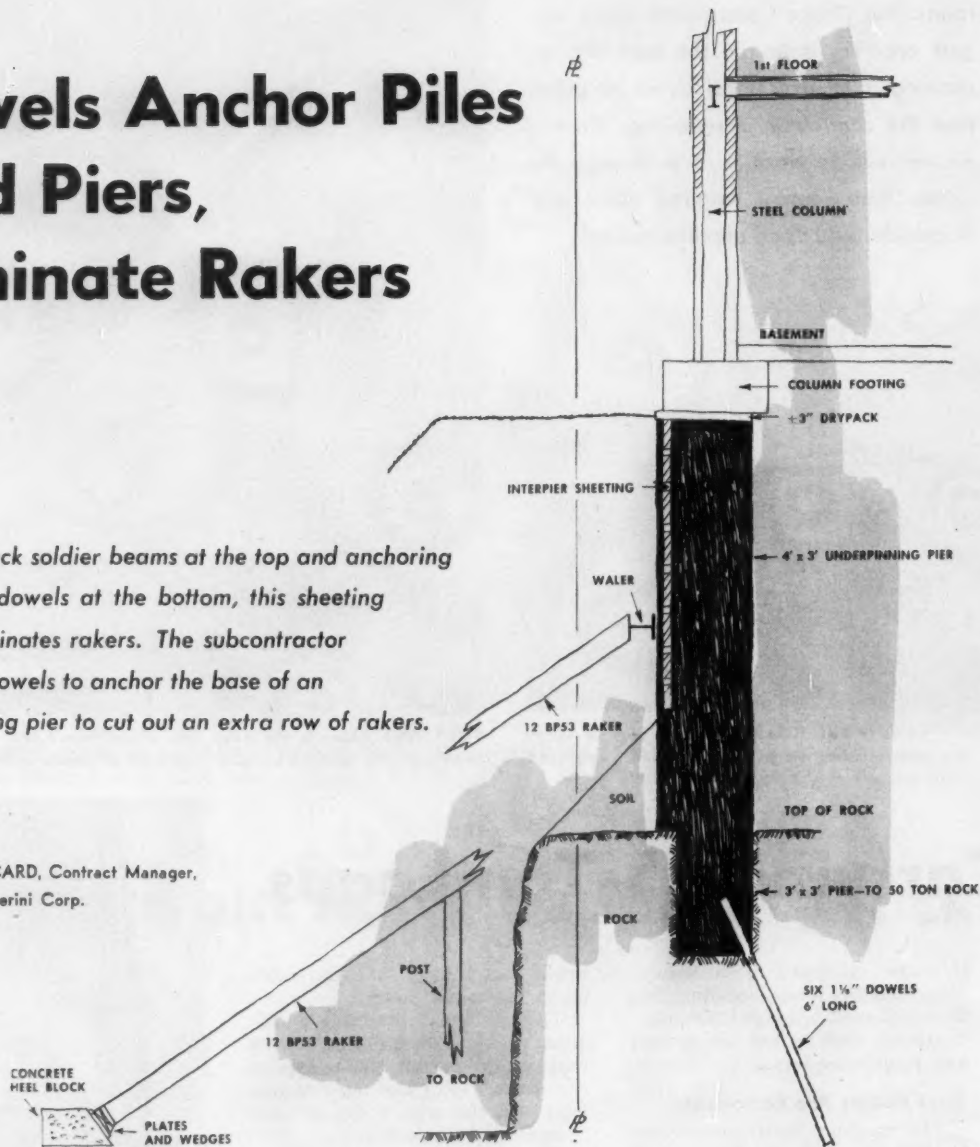


OVER THE SIDE—This method of unloading solved a problem for the contractor—how to get trucks loaded with 25 tons of rock into dumping position on the jetty.

Dowels Anchor Piles And Piers, Eliminate Rakers

By tying back soldier beams at the top and anchoring them with dowels at the bottom, this sheeting system eliminates rakers. The subcontractor also used dowels to anchor the base of an underpinning pier to cut out an extra row of rakers.

By RICHARD CARD, Contract Manager,
Building Div., Perini Corp.



A SHEETING SCHEME that involved tying soldier beams at both top and bottom eliminated rakers and speeded foundation work on Rochester's Midtown Underground Garage. Dowels grouted into the underlying rock firmly secured the base of the soldier beams. Ties anchored by deadmen held the tops.

Subcontractor Coakley & Booth, Inc., of New York, also used the dowel arrangement to anchor piers underpinning three buildings adjacent to the four-acre site. Here, this method eliminated the need for a second tier of rakers.

Two Northwest 80D shovels excavated overburden and blasted rock, and Coakley & Booth's crew installed sheeting as this work progressed. They completed a 400-ft-long section alongside a street in just eight weeks.

First, a crew dug a 2-ft-wide trench to expose a 200-ft-long steam line buried at a depth of 6 ft just outside the building line. A rig then drove 14BP73 soldier beams at 8-ft centers on a line about 14 in. outside the steam line. Average depth to refusal in rock was 16 ft. The rig was equipped with a Vulcan No. 1 hammer supplied with air from a 900-cfm Joy compressor.

Next, the crew tied back each soldier beam with two 1½-in. tie rods anchored by a 10BP42 deadman buried about 3½ ft below the street. At the other end, the tie rods passed through holes cut in the web of a 14BP73 waler. The waler was placed with flanges horizontal. A 1½x2-ft plate 1½-in. thick on the outside of the waler served as a bearing plate for the nuts holding the tie rods.



NO RAKERS—Contact Sheeting retains a 400-ft-long wall alongside a street. Clamps hold timbers against flanges of soldier beams.



ONE ROW OF RAKERS—Sheeting between underpinning piers braced by rakers is held by bolts cast into the concrete of the piers.

To secure the steam line, the crew dug 2-ft-wide pits beneath the 18-in. line at each soldier beam. Brackets made of 6-in. and 10-in. I-beams built to cradle the line were welded to the soldiers.

A Northwest shovel worked right up to the face of the soldiers to excavate the berm. As excavation progressed, three-man crews placed sheeting to retain the embankment.

The subcontractor made use of a patented method called Contact Sheeting. The method eliminates hand excavation behind the flanges of the soldiers. Instead, a bolt assembly holds pairs of timbers tightly against the outside flanges of the soldiers. One man with a hand wrench snugs the bolt assemblies while two other workmen set pairs of timbers in place. The crew averaged 300 sq ft of sheeting per day.

Excavation proceeded in stages so that soldier beams were not fully loaded until secured by dowels at the bottom. As soon as rock was exposed, a crew

temporarily blocked each soldier. Then they cut out unsound rock with a pneumatic breaker and drilled six 1 1/4-in. holes in front of each pile. A 1 1/4-in. dowel was grouted in each hole to hold the base of the soldier. In addition, about 1 yd of concrete grouted the pile to solid rock.

By eliminating rakers, this sheeting system provided working room for crews forming and pouring the base slab of the garage. Rakers were necessary, however, to brace underpinning placed beneath three buildings. But use of dowels to secure the base of piers eliminated a bottom row of walers and rakers.

Underpinning the 60-ft-high Loew's Theater was relatively easy because footings of the building were oversized. The underlying hardpan was capable of withstanding considerably more load. So the subcontractor sank 3x3-ft pits under a few column footings at a time without shoring the building.

The hardpan was so solid that sheeting the pits was not necessary. Crews with air breakers found the going rough, but after hard cutting they hit rock 6 to 10 ft below the bottom of the footings.

To seat the underpinning piers in solid rock, a crew blasted in 2-ft lifts until sound material was reached. They drilled holes at a 45-deg angle in the rear face of the rock socket. Dowels grouted in these holes secured each pier from overturning, eliminating tie-backs to the frame of the building.

After concreting the pits and drypacking at the tops, the subcontractor excavated the berm. A crew installed Contact Sheeting between piers as excavation proceeded. Bolts cast into the concrete piers secured the sheeting. They had been positioned in holes drilled in the hardpan face of each pit prior to concreting. There were two rows of the 3/4-in. bolts at 12-in. centers at each pier.

Underpinning two hotel buildings on another side of the lot was done in about the same way. But because of horizontal seams in the rock, shoring was necessary.

Coakley & Booth shored each column at the first-floor level with a 20-ft-long 8WF40 inclined at an angle of about 70 deg. A timber footblock made up of a 12x12 and a 3x12 at the base of each shore took up the load when steel wedges were driven home between two 1-in. steel plates.

After digging an approach pit along the outside of each column footing, the crew placed a 10-in. I-beam strut under each side of the footing. The entire shoring system consisted of a tripod with one long leg and two short legs. It eliminated costly needle beams.

Crews dug 3x4-ft pits 16 to 19 ft to bedrock for the underpinning piers. After blasting to seat the piers in sound rock, the crew drilled six 1 1/4-in. holes 6 ft for dowels, which again eliminated a second tier of rakers.

Concreting, excavation, and sheeting proceeded as before. A 12BP53 raker seated on a concrete heel block held a 14BP73 waler about 10 ft below the bottom of the footings.

The Building Division of Perini Corp. was in charge of construction. Mark Sagal is vice president and general manager and J. E. Goddard is construction manager. Supervising construction in the field is John Schwartz, superintendent, and David Holmes, project engineer. Walter E. Larson was in charge at the site for Coakley & Booth, Inc.

Two million yd of hydraulic fill must be placed within a timber bulkhead to extend an airport runway 2,000 ft into Lake Pontchartrain, La. A lake-bottom borrow pit about a mile away supplies all of the fill. A hydraulic dredge places it.

IN THE BORROW PIT—Hydraulic dredge pumps about 1,000 yd of fill material per hr from a lake-bottom borrow pit that is about 80 ft deep.



Lake-Bottom Dirt Makes Runway Fill

A HYDRAULIC DREDGE is handling all earthmoving for an airport runway that will reach 2,000 ft into Lake Pontchartrain, La. The extension will be built on fill placed in 14 ft of water.

The runway extension is the first phase of a \$9.8-million expansion project that will double the size of New Orleans Airport. The second phase calls for construction of a new east-west runway and taxiways on land salvaged from Lake Pontchartrain.

Hydraulic fill dredged up from the lake bottom is forming the base of the runways. A timber bulkhead around the fill prevents washouts and protects it against storm damage.

Bauer Dredging Co. of Port Lavaca, Tex., holds the \$1.8-million contract to build 4,500 ft of bulkhead and to place nearly 2 million yd of hydraulic fill for the north-south runway extension. One suc-

tion dredge is getting all of the fill required from a lake-bottom borrow pit about a mile from the site.

Dredge Works 'Round the Clock

Bauer's dredging crew averages about 67 men. The dredge works 24 hr per day, weather permitting, and it pumps about 1,000 yd per hr. This 50 x 175-ft dredge is one of the largest ever built. Bauer bought it from the Corps of Engineers in 1952, but only the hull of the original unit remains.

One modification was the extension of the ladder to a length of 117 ft. This enables it to reach the 80-ft maximum depth of the borrow pit; the original ladder could reach only 60 ft.

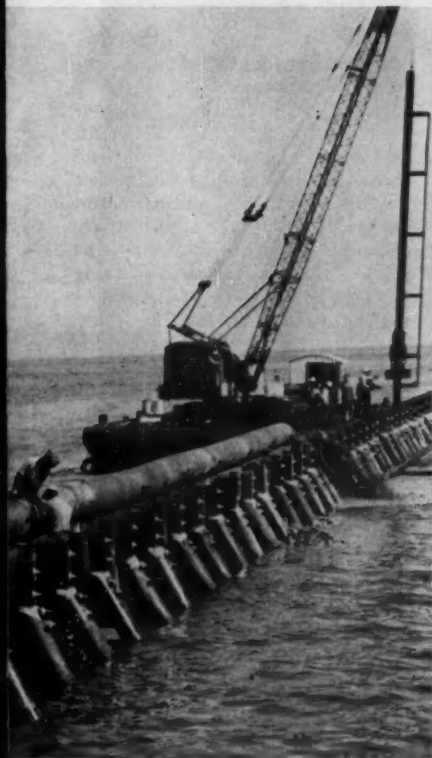
Main power plant of the dredge is a 4,000-hp Cooper-Bessemer engine. Two auxiliary units are a 1,400-hp Cooper-Bessemer engine and a 900-hp GM engine. The cutter motor is rated at 800 hp.

Suction and discharge lines are 30 and 24 in., respectively, and the discharge pressure is 80 to 110 psi. No booster pump is needed on this job.

The borrow pit is 3,000 ft long and 1,000 to 1,340 ft wide. Although the water is only 14 ft deep, suitable fill starts at a depth of 30 ft. To reach this, Bauer stripped about 16 ft of lake-bottom mud and silt and dumped it in another section of the lake.

The dredge covers the borrow area by making 400-ft swings across the pit. Pumping distance to the fill area varies from 4,000 to 6,600 ft. A portion of the discharge line floats on pontoons, but 2,200 ft of it is submerged to avoid interference with shipping. The discharge end of the pipe simply lies on top of the fill.

Two Y-junctions along the pipe are equipped with a gate valve on each downstream leg to direct the flow to the proper spot on the fill. One Y is atop the west bulkhead; the other is on the centerline of the runway. Only one line discharges fill at a time.



HOLDS FILL—American crawler crane on a barge drives timber sheeting for bulkhead. Pipe on top discharges hydraulic fill.



AT THE DISCHARGE END—Small Bantam crane mounted on a swamp buggy moves sections of 24-in. pipe so discharge can be directed to the proper spot on the fill. Y-junctions equipped with gate valves are installed along the pipe to help control the discharge.



ALONG THE BULKHEAD—McKiernan-Terry steam hammer drives timber piles to their proper depth along the bulkhead. Rough seas pulled up some piles after a portion of the fill had been placed.



THE BULKHEAD—Wakefield sheeting and timber piles make up the bulkhead. Sheeting is 11 in. wide and 36 ft long; vertical timber piles are 50 ft long, timber batter piles at 30 deg are 60 ft long.

Bulkhead Protects Fill

Timber piles and Wakefield sheeting form a bulkhead around the fill to keep it from washing away. The bulkhead is 2,207 ft long on the west side and 1,857 ft long on the east side. The fill is 800 ft wide, but the bulkhead along the end only covers 500 ft. A 300-ft gap in the center serves as a drain for excess water.

The bulkhead consists of 11-in.-wide 36-ft-long Wakefield sheeting and 15-in. vertical timber piles backed up with batter piles at 30 deg. Vertical piles are 50 ft long and batter piles are 60 ft long.

Vertical piles were driven first to establish alignment; batter piles were driven next. A 40-ton Bucyrus-Erie steam rig with a McKiernan-Terry 9B3 hammer handled the pile driving. The rig

was mounted on a converted Navy LCT and was equipped with a 93-ft boom and 85-ft leads.

Two 1½-in. steel rods tie each batter pile to the vertical pile. Two-foot-long 8 x 12 head blocks atop the batter piles reinforce the connection. A head block is bolted to each vertical pile with two 1-in. rods.

Wales along the inside of the vertical piles are 16-ft-long 8x12's.

LAKE-BOTTOM DIRT MAKES RUNWAY FILL . . . continued

They tie the piles together and hold the sheeting in place. The sheeting consists of four 3 x 20's that are bolted together and driven as a unit. Each unit is tied to the wales with a 1/2-in. pin.

To drive the sheeting, Bauer rented a 25-ton American crawler crane that worked from a barge. The crane was equipped with a 40-ft boom and 35-ft leads and drove the piles with a 1,500-lb drop hammer.

Additional wales, 18-ft-long 3 x 8's, are installed along the inside of the sheeting. Galvanized sheet metal is nailed to the tops of piles and the sheeting to protect the wood. The top of the bulkhead is 7 ft above water level.

Storms Damage Bulkhead

Rough seas and near hurricane storms on Lake Pontchartrain twice wrecked portions of the bulkhead. Both times Bauer had

to drive piles and sheeting to repair the damage.

Another bulkhead failure occurred after a portion of the fill had been placed. The bulkhead could not contain the weight of the fill and bulged outward and upward in an area previously damaged by storms. To repair this section, Bauer had to dig away the fill on the inside of the sheeting and then redrive the piles. The American crane was equipped with a clamshell bucket to excavate the fill.

To guard against high seas, the contractor has decided to place fill along the outside of the sheeting to serve as ballast and to prevent lateral movement of the piles. Bauer is dumping 100,000 yd of fill on the outside of the bulkhead by running the discharge line along the top of the sheeting.

Two rigs handle the pipe to extend it or to break it down for moving from place to place. A derrick boat with an A-frame boom moves the pipe along the bulkhead where no solid access is available. A crane takes care of this job on the fill.

The crane is a Schield Bantam unit that is mounted on a swamp buggy. It rides on pontoons equipped with tracks and can maneuver easily in mud or float in water. The crane can be rigged with a 2-yd dragline bucket for excavation.

It takes two operators to handle this unit because a separate engine powers the undercarriage and the crane. One operator takes care of maneuvering; the other controls the operating functions.

Men on the Job

The Orleans Levee Board is in charge of design, engineering, and inspection for the airport job. The Board also directs other land reclamation projects along Lake Pontchartrain.

In charge of the project for the Orleans Levee Board is A. L. Willoz, chief engineer. His assistant is Larry Bodet. Major Louis A. Barattini, Sr., is inspector.

Bauer Dredging Co. personnel includes F. O. Porche, dredge captain; J. C. Wood, chief engineer; and George Lambert, assistant chief engineer. Allan Gerard is deck captain. Directing the pile driving and other work on the fill is Harold Jones.

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Gooseneck type, tandem axle tilt-trailer. Capacities 14 through 22 tons.

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Tandem axle. Capacities 14 through 40 tons. Drop deck or flat deck.

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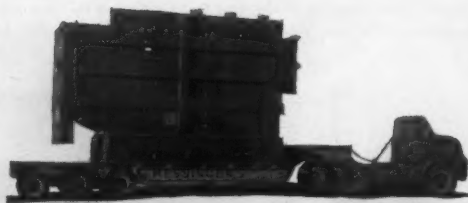
Triple-axle, with or without removable gooseneck. Capacity 20 through 100 tons.

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Completely new specifications for assembly of structural joints using high-strength bolting were announced in March by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation. These specifications are reprinted in full in our new booklet, "High-Strength Bolting for Structural Joints."

The booklet introduces the recommended heavy head, short thread bolt, new washer sizes, and latest bolting procedures, as well as instructions on how to order high-strength bolts.

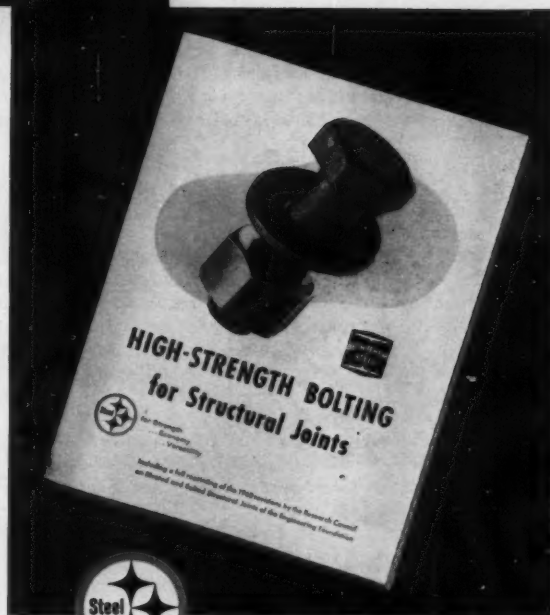
Also included are complete and up-to-date dimensions, sizes, and ASTM specifications for bolts, thread lengths, nuts, and washers.

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for any other rubber-tired tractor-shovel

"Our '4-in-1's' do the work of 3 to 5 machines. No contractor should be without them," says a Superintendent in explaining how a PAYLOADER with Drott "4-in-1" Bucket reduces equipment investment, and time and labor requirements on many contracts.

This unique Bucket, says one PAYLOADER operator, "is like a magic wand because it can do so many things." What's more, because of its rubber-tire mounting, it can work on or off the highway — can work on streets and walk over curbs and sidewalks without damaging them.

It's a Clamshell and as such is most spectacular — and profitable. The powerful hydraulic clam action grips stumps, boulders, concrete slabs and other irregular shapes quickly and firmly; can deposit them gently in a truck. With the clamshell action, you can fill the bucket without forward motion of the tractor — can clean-up close to obstructions and pick up small piles of dirt from the street cleanly. One contractor says, "We save 90% of clean-up costs with the '4-in-1' unit."

It's a Bulldozer with the clam portion raised. The rear half of the "4-in-1" Bucket is a true bulldozer with an engineered moldboard curvature for smooth earth-rolling action. Accuracy and ease of control is possible because of the exclusive radius control and instant, responsive forward-and-backward tilt for depth control.

It's a Scraper — a bottom-loading scraper for stripping with fractional accuracy. Like a carpenter's plane, the blade of the bulldozer portion does the cutting while the clam segment ahead acts as a depth gauge — and all



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Drott "4-in-1" Buckets are available exclusively-on-rubber on PAYLOADER tractor-shovels, and for all five 4-wheel-drive Models — bucket capacities from 1 to 4 cu. yd. (S.A.E. Rated). Your nearby Hough Distributor is ready to give you complete data on PAYLOADER with "4-in-1," or other useful Allied Equipment.

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PAYLOADER®



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Pipe-laying is another of the many ways these multi-purpose

tractor-shovels can reduce your
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When you buy a PAYLOADER you have *more* than a tractor-shovel. You have the most *proven* tractor-shovel, and the most *useable* — because of the many and unusual kinds of allied equipment that you can use with it. Several of these tools are available *exclusively* on rubber-tired PAYLOADER tractor-shovels.

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Superior-Hough Sideboom is one of the useful and unusual pieces of allied equipment available exclusively on PAYLOADER tractor-shovels. It is provided for three Models with lifting capacities up to 6 tons at 4-ft. overhang. This Sideboom with 4-wheel-drive mounting can be used on paved streets and highways without damaging the surface. All Sideboom operations are powered by the PAYLOADER hydraulic system — the line winch by hydraulic motor, the booming and boom-telescoping by twin double-acting hydraulic rams. All controls are convenient to the operator at his regular position.

Backhoes are available for front or rear mounting on several PAYLOADER sizes and are recognized as the best-engineered in the industry. One of these can be rear-mounted on several PAYLOADER sizes along with the Sideboom and "4-in-1" Bucket, and any of these three tools can be used on the same job.

Blacktop Spreader interchanges with the bucket and has its own engine power. With hopper capacity of 2 cu. yds., it lays hot or cold mix up to 8-ft. wide



Sideboom does not interfere with bucket use

and up to 6-in. thick — instantly adjusts for widths up to 4 ft.

Vibratory Compactor is available for several 4-wheel-drive PAYLOADER models and interchanges with the bucket. It is self-powered and self-contained, and develops maximum densities in all granular soils.

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From the PAYLOADER line you can select the exact size and type of tractor-shovel that fits your needs and budget because there are eight basic sizes and more than twenty models.

Other Allied Equipment includes earth augers, forklifts, winches, backfill and angling blades, "4-in-1" bucket, snow plows. Your HOUGH Distributor is ready to show you how a PAYLOADER with its multi-purpose usefulness can work economies for you the whole year through.



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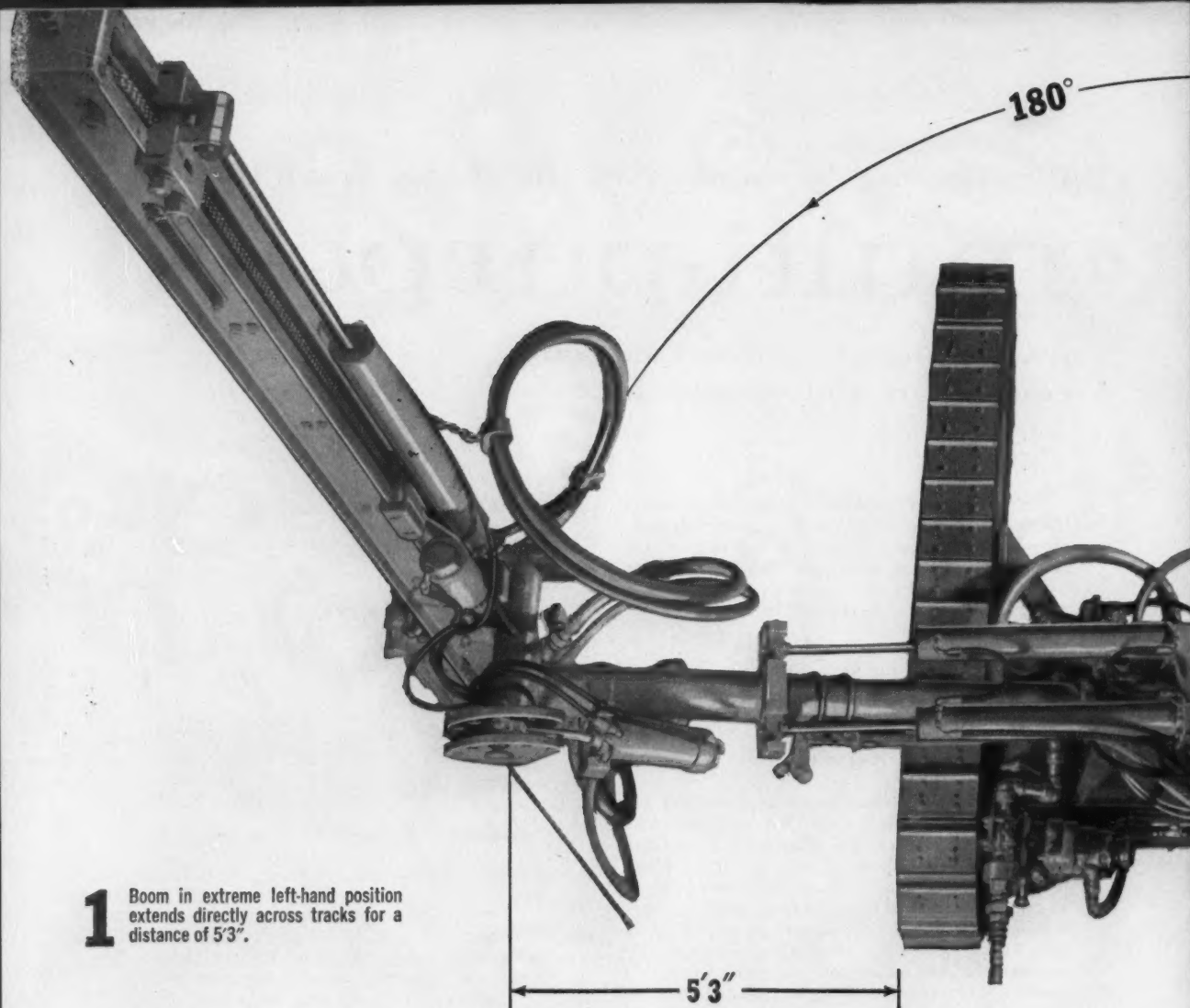
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1 Boom in extreme left-hand position extends directly across tracks for a distance of 5'3".

TRACDRIL'S 180° "BOARDING

The construction team of Briggs-Connelly-Dennis, working the difficult Route 40 Relocation through the Donner Pass at Truckee, California, found that with the full 180° ground coverage of the G-900 fewer moves are needed... that more blast holes could be drilled from every set-up.

The high altitudes didn't bother the CP-600 "Power Vane" Rotaries either... singly or in batteries... they kept the Tracdrils at full throttle 'round-the-clock.

Rugged, boulder-strewn country couldn't stop the Tracdrils... the worst footing was taken in stride.

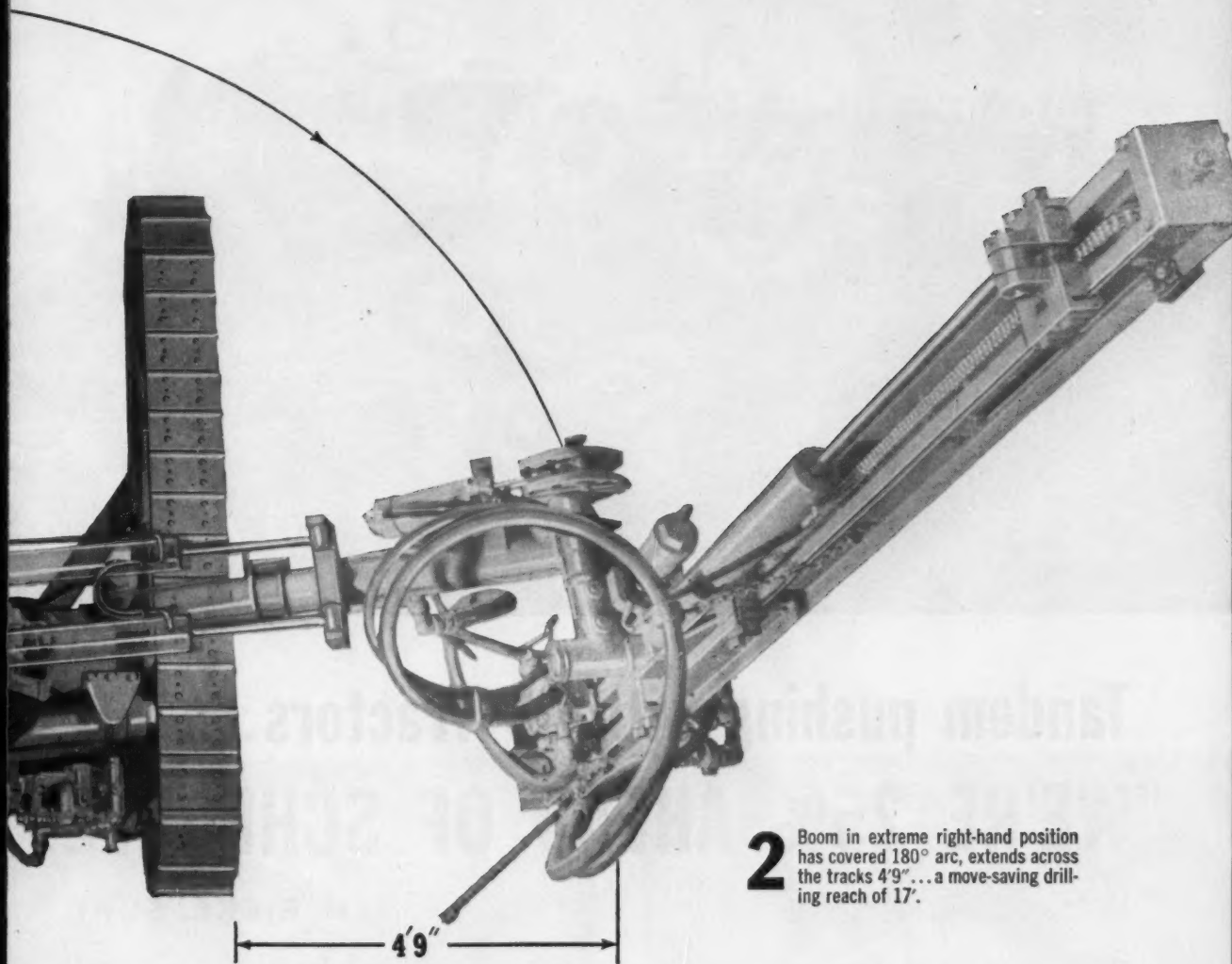
In addition to the time-saving advantages of a 180° "Boarding House Reach," G-900 Tracdrils have the reputation for:

- Remarkable ability to shift from straight verticals... to high horizontals, 11 feet at the face... or to snake holes at ground level.
- The real advantage of two sets of grouped controls... one at turret, one at boom end... saves drillers time and steps.
- Heavy-duty brakes that lock and hold the instant tramming throttle is released.

You'll want a copy of Bulletin SP-3267 that includes complete specs, operating diagrams and dimensions on the revolutionary new G-900 Tracdril. Write today to: Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.

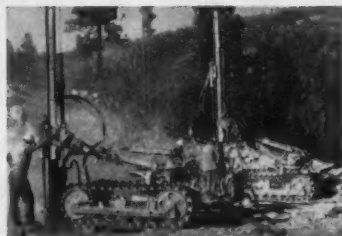


ROCKY LEDGES, with sheer drops are common in Donner Pass. Knee-action tracks and fast-acting automatic brakes combine a stable drill mount with driller safety.



2 Boom in extreme right-hand position has covered 180° arc, extends across the tracks 4'9" ... a move-saving drilling reach of 17'.

HOUSE REACH" PAYS-OFF!



(Left) BATTERIES OF CP-600 "Power Vane" Rotaries supply the "Go-Power" to teams of Tracdrills. Feature: easy portability — low maintenance, high altitude operation and "hands-off" dependability.

(Right) **YOU CAN'T ALWAYS PICK** the conditions . . . but you can pick the equipment you know will do the job . . . get the "Boarding House Reach" of a G-900 for your next project . . . it will pay-off for you!



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Tandem pushing with D9 Tractors...

"WE'RE 25% AHEAD OF SCHEDULE"

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The Cat D9E Tractors in tandem get full

loads . . . fast loads. In addition to power, two factors ideally suit the D9 to this task: the power shift transmission permits split-second, on-the-go speed changes with finger-tip ease to meet changing load requirements; and, the special pushloading equipment allows smooth, on-the-run contact with scrapers, eliminates dead seconds from loading time.

Tandem pushloading may be a real money-making proposition on your job. Your Caterpillar Dealer will be glad to discuss job requirements, demonstrate the D9 and its complete line of pushloading equipment. See him soon.

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* Mfd. by Pushin'-Cushin', Inc., Perry, Kansas

WHY D9E GIVES YOU EXTRA PROFIT ON EVERY JOB

POWER 335 HP turbocharged D353 Engine provides muscle for big loads, is dependable and economical.

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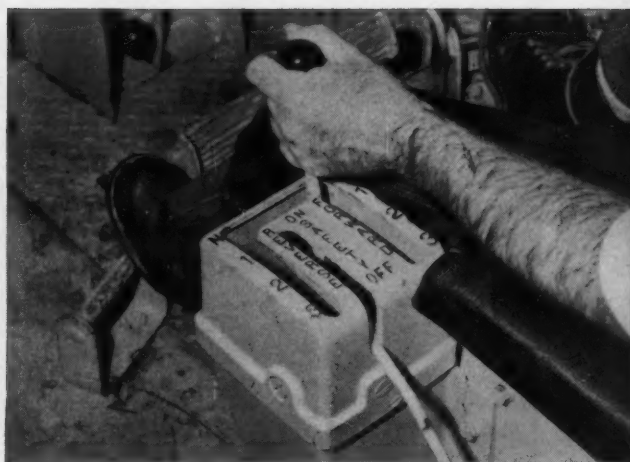
finger-tip ease... even under full load. Exclusive torque divider combines anti-stall characteristics of a torque converter with operating snap of direct drive.

PLUS: Lifetime lubricated track rollers, easy-to-service dry-type air cleaners, convenient hydraulic track adjusters. Unexcelled operating ease, comfort and safety.

Caterpillar offers the most complete line of big-tractor attachments and tools available to keep your production profitable.



Smooth on-the-go contact...up to 3 MPH! Pushin'-Cushin'* is one of several specialized pushing attachments available for the D9E. Attachments like this increase the machine's usefulness.



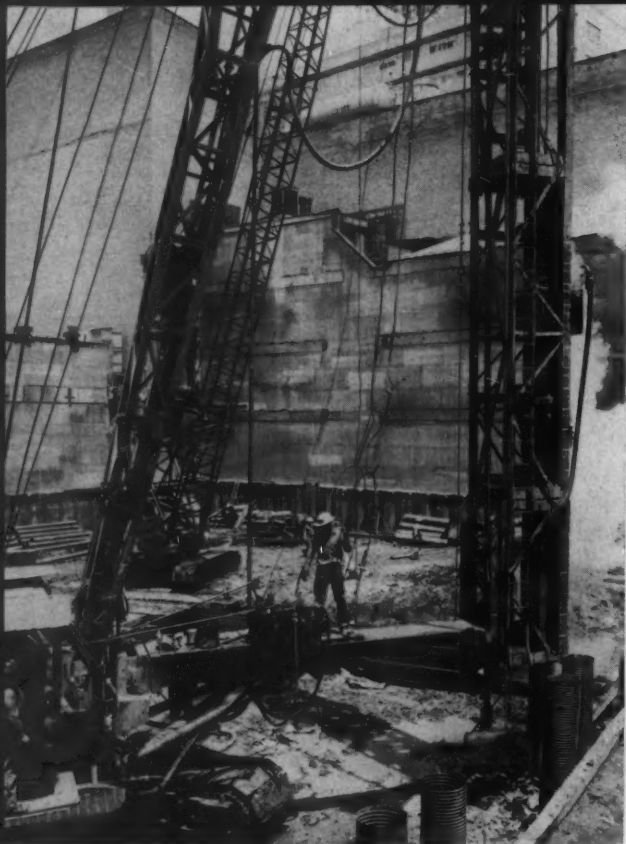
The Cat power shift transmission is designed to give you plenty of power fast in the highest gear possible. Ease of shifting lets operator get more work out of the tractor, lessens his fatigue.

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WITH D9 PUSHER TRACTORS**

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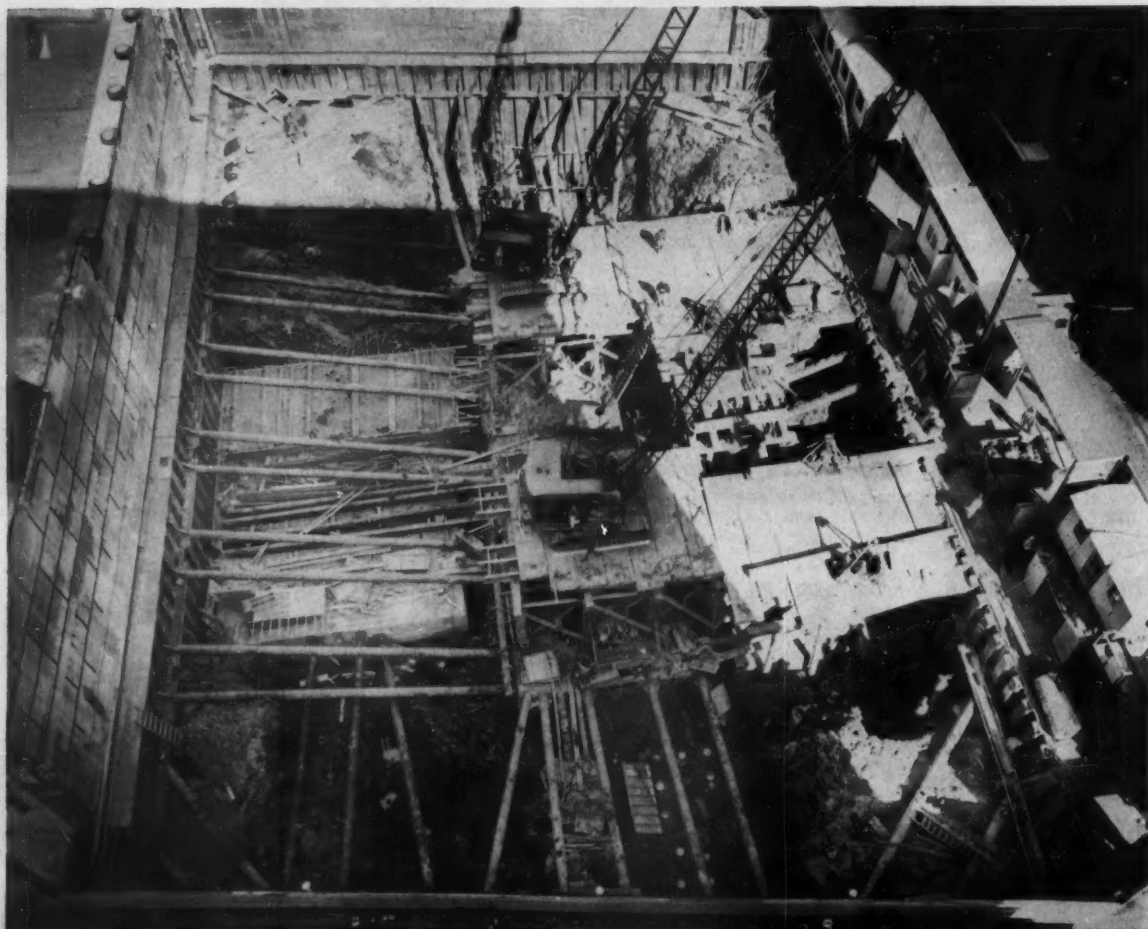
CONCRETE PILES—Raymond pile driver installs shells for 750 step-tapered, 60-ton concrete piles.

Prestressed Pipe

By JOHN SILINSH, Assistant Editor

The tallest building in New Orleans will rest on the deepest foundations ever built in that city. Foundation excavation was completed in three stages, and pile driving and concreting of pile caps were carefully scheduled to keep the excavation symmetrical until pipe struts were installed to brace the sheet pile wall around the building site. The struts are made of steel pipe that during installation is precompressed an amount equal to the active earth pressure on the outside of the sheeting. The struts help reduce site congestion.

PIPE BRACES—Precompressed struts brace sheeting around the excavation. Pile caps serve as heel blocks for the struts.



Struts Brace Sheet Pile Wall



CONSTRUCTION BRIDGES—Timber piles carry two temporary trestles that extend 65 ft into the excavation and provide street-level access.

THREE-STAGE EXCAVATION and sheet piling braced with rakers made of prestressed pipe highlighted the foundation work for New Orleans' tallest building. The 28-story structure is in a congested area where adjacent buildings and lack of access forced the contractor to devise some unusual techniques to simplify the job and insure safety.

Here are some of the methods and materials used by the general contractor, Crane Construction Co. of Chicago, and the foundation subcontractor, Keller Construction Corp. of New Orleans: **EXCAVATION.** Work was carried on in three stages. First, the entire site was excavated to a 6-ft depth. Then piles were driven and a portion of the hole was dug to a 25-ft depth. Pile caps, constructed within the hole, served as heel blocks for rakers that backed up the sheet piling. When all rakers were in place, the excavation was completed.

TRESTLES. The building site is confined and lack of access complicated the foundation work. To bring in heavy equipment the contractor built two temporary construction bridges, or trestles,

that extended into the excavation at street level. From the trestles, cranes could reach all parts of the site.

PILES. Poured-in-place concrete piles support the building, and round timber piles carried the temporary trestles. When the foundation was completed, the timber piles were sawed off at the tops of the footings.

SHEETING. A cofferdam of steel sheet piling surrounded the excavation. The piling will remain in place along two sides of the building but was removed along two street sides. Corrugated sheeting in the excavation retained earth around the 25-ft-deep center hole and served as formwork for pile caps poured within this hole.

RAKERS. Large-diameter pipe struts were specially fabricated for this job. During installation the pipe was precompressed an amount equal to the active earth pressure at the wale. This kept the sheet piling from shifting after the hole was excavated. Pipe was used for the rakers because it has a greater section modulus than other structural shapes made of steel or timber.

Excavation—Stage 1

Before starting to excavate, the contractor drove steel sheet piling along all four sides of the 113x164-ft building site. The building itself is 109 ft wide and 115 ft long.

Sheeting along the two street sides consisted of L. B. Foster MZ 38 sections that were rented and were pulled when the foundation was completed. Sheet piles along the two property lines are L. B. Foster MZ 32 sections that will remain in place permanently. All sheeting was driven with a McKiernan-Terry 3B hammer.

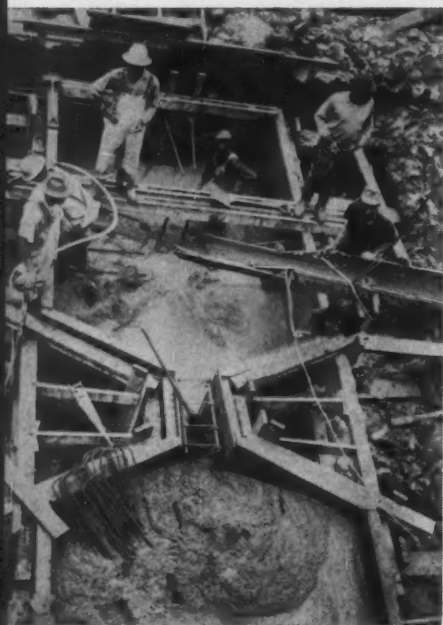
Maximum depth of the excavation was 25 ft; the sheet piles were 40 ft long and required bracing. But the contractor wanted to keep bracing to a minimum to reduce congestion within the excavation. Instead of timber or steel rakers, he developed a system of 48 pipe struts that required only one level of wales along the inside of the sheet piling. The bracing system was designed by A. W. Thompson & Assoc. of New Orleans, engineering consultants for the foundations.

The wales were 5½ ft below the sidewalk. To save time, the contractor excavated the entire site to a level 6 ft below the sidewalk and installed wales and piles at the same time.

All piles were driven from this 6-ft level because the site was unobstructed, and heavy equipment could move about easily. Below this level the pipe struts would get in the way, and moving machines in and out of the hole would be difficult.

Raymond International, Inc., installed 750 step-tapered, 60-ton piles for the building. The piles extend 10 ft into a sand bed about 83 ft below the sidewalk. Raymond drove the pile shells to the required depth and filled them with concrete only to a level 25 ft below the sidewalk. Later, as excavation continued, the empty portions of the shells were cut off to the required elevation.

Timber piles for the temporary



PILE CAPS—Crews place concrete for two pile caps. Grade beam between the pile caps transmits horizontal forces exerted by struts that will rest against the caps.

trestles also were driven from the bottom of the 6-ft-deep excavation. The 40-ft timber piles were 14 in. in dia at the cut-off and 9½ in. in dia at the tip. All piles were pre-drilled to remove dirt from the hole and to prevent heaving.

Excavation—Stage 2

When all operations at the 6-ft level were completed, Keller excavated a 31x86-ft hole near the center of the site. A dragline dug the hole to the 25-ft maximum depth of the excavation.

Ten pile caps were formed and poured within this central hole. The pile caps were interconnected with 18-in.-wide grade beams and surrounded by a 12-in.-thick chain wall. The entire structure serves as a giant heel block for 31 pipe struts.

Corrugated Armco sheeting, driven with a jackhammer, surrounds the 25-ft-deep hole. The 15-ft-long sheeting kept dirt from falling into the hole and served as formwork for the pile caps and the chain wall around the outside of the caps.

Pile caps within the central hole are 9 ft wide and about 12 ft long. Some are as thick as 7½ ft and required 280 yd of concrete. Cranes working from a completed portion of the temporary trestles handled the concreting. All concrete for the foundation is designed for a strength of 3,000 psi at 28 days.

Excavation—Stage 3

With the central pile caps in place, the site was ready for installation of the pipe struts and excavation of the remaining dirt. Here, Keller had to be careful to keep the sheet piles from shifting and damaging adjacent structures.

Pairs of pipe struts on opposite sides of the hole were installed at the same time. The grade beams between the pile caps transmitted earth pressure from one strut to the other and prevented the piles and sheeting from shifting.

Installation of the struts was a slow operation. First a crew dug away dirt to form a ditch between the wale and the pile cap on each

FLECO® FACT FILE

Owner reports: "This Rake is the answer to land clearing!"



"The Fleco Rake-equipped 944 Traxcavator is maneuverable and fast. It can pick up and shake a load of debris free of dirt and place the load on the hottest part of the burning brush pile," reports Mr. G. C. Troup. This job, shown at left, consists of clearing trees and brush from 4,960 acres of land for planting citrus near Fort Pierce, Fla. Also working are Fleco Rakes on two D8s, a D6 and a D4.

Mr. T. O. Nelson, co-owner of Nelson Construction Co., Seattle, Wash., has this to say about his Fleco Rake on a 955 Traxcavator (shown at right): "It is a marvelous piece of equipment. This Rake is the answer to land clearing. It makes it possible to shake the dirt out of the roots for burning and is nice for cradling a load."

Mr. Richard S. Smith, Supt. and Vice President of Avon Construction Co., Avon, Conn., says: "Our 955 Traxcavator, with the Fleco Rake, has more than doubled the clearing on road rights-of-way, the big feature being that size and shape of material handled doesn't matter. Anything goes!"

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side of the building. Next, the pipe struts were positioned in the ditch and welded to the wales. Then the pipe was compressed with hydraulic jacks and grouted at the heel block.

The struts are made of 16-in.-OD pipe with a $\frac{3}{8}$ -in.-thick wall. Length ranges from 36 to 50 ft depending upon the location within the excavation. The pipe was specially fabricated for this job by L. B. Foster.

At the wale, the pipe was cut off at an angle and a bearing plate was welded to its end. The plate, in turn, was welded to the flange of the wale. The wales are 16WF58 beams reinforced with web stiffeners and braced with angle brackets.

At the heel block, the pipe was fitted with a bearing plate welded to the end and push plates on each side of the pipe. A Simplex hand-operated hydraulic jack was inserted between each push plate and the heel block. Pressure was applied on the pipe until a load of 100,000 lb per strut was

continued on page 118



AT THE WALE—Pipe struts are welded to the flange of the 16WF58 wale $5\frac{1}{2}$ ft below the top of the sheeting. Angle braces and web stiffeners reinforce the wales.



AT THE HEEL BLOCK—Hand-operated hydraulic jacks exert a 100,000-lb force on push plates welded to the pipe; Embeco grout seals gap between pipe and pile cap.

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Wm. Joshua Barney, Jr., left, and Fred Weller inspect work in progress at another Barney construction project, New York's new thirteen million dollar bus terminal.

"I like a man who's there when he's needed"

"I like a man who's there when he's needed. Fred Weller is," says Mr. Barney, Executive Vice President of W. J. Barney Corporation. "Like every member of the American Mutual local team, he gives me the kind of service I like."

Through Safety Engineer Fred Weller's advice and counsel, Barney has improved its insurance protection, reduced its accident experience and has brought its Workmen's Compensation rates, over the past 5 years, 22% below industry average.

An American Mutual local team can advise your company how to get better protection at lower cost, too. There are 81 fully-staffed local offices around the country. You'll find yours in the Yellow Pages.

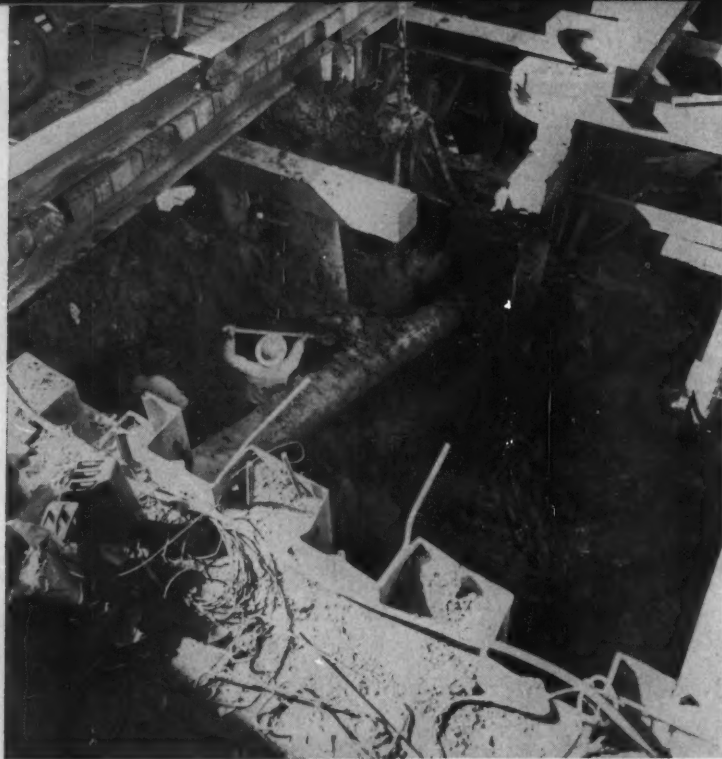
American Mutual



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Woburn, Massachusetts

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FINAL EXCAVATION—Crews dig dirt away from the piles and struts by hand because the clamshell cannot work in tight quarters. The clamshell loads the trucks.

PRESTRESSED PIPE STRUTS

reached. Embeco grout between the heel block and the bearing plate completed the installation of the struts.

The central pile caps serve as heel blocks for 31 struts. Pairs of parallel struts on 7-ft centers rest against each of the pile caps. These are 19 ft 2 in. apart in the direction of the long dimension of the building. Struts at the corners of the excavation are oriented at different angles.

In addition to the struts that rest against the central pile caps, there are eight struts resting against other pile caps and nine diagonal struts that were installed horizontally from wale to wale at the corners. Pipe for the corner struts is 16 in. OD and has a 1/2-in. wall thickness.

After installing the struts around the ten central pile caps, Keller dug out more earth for pile caps that now serve as heel blocks for the eight additional struts. To transmit forces between pile caps supporting these struts, the contractor inserted temporary 12x12 timber struts between the caps.

BUILD AND MAINTAIN ROADS THE **ROME** WAY



Here's the answer to your problems of mixing, pulverizing and aerating base materials in road construction and maintenance: the new Rome Model TAG Motor Grader Disk Harrow. With 16 disk blades 28" in diameter, the full power and traction of a Caterpillar No. 12 or No. 14 Motor Grader can be used to cut and mix material 7' wide on each pass. Spring-loaded lift links attach to the Motor Grader's blade and scarifier lift arms, giving the operator complete control over the harrow's position and penetration. This new tool is helping contractors to realize substantial savings in both secondary road maintenance and new construction. Your Rome-Caterpillar Dealer has the facts on a complete line of Rome Heavy-Duty Equipment to match your job and equipment. See him now.

ROME PLOW COMPANY, Cedartown, Georgia, U. S. A.

ROME

**YOUR ROME DEALER
IS YOUR
CATERPILLAR DEALER**



**HEAVY-DUTY LAND CLEARING,
TILLAGE AND
LAND PREPARATION EQUIPMENT**

Before installing the additional struts, Keller completed the temporary construction bridges so that cranes can reach all parts of the hole. Building the trestles was a construction project in itself. The trestles rest on bents that consist of 40-ft-long timber piles. The bents are 10 ft apart and carry steel stringers and a timber mat. The trestles extend about 65 ft into the excavation.

Once the trestles were in place, they served as access ramps for excavation, concreting, and materials handling for construction of the basement floor and walls. When the trestles were no longer needed, the timber mat and the steel stringers were removed, and the piles were cut off at the tops of the pile caps.

A 12-in.-thick concrete slab over the pile caps forms the basement floor. The finished floor is 17 ft 3 in. below the sidewalk.

The basement walls and the floor slab for the street-level floor are designed as integral parts of the foundation to strengthen the building. The basement walls are

13 in. thick with heavy vertical reinforcing that takes the earth load on the outside of the wall. The floor slab for the first floor is 6 in. thick and is integrated into the foundation structure.

After completing the wall, Keller removed the pipe struts. They were detached from the wales and the heel blocks and removed from the basement either in one piece or in short sections.

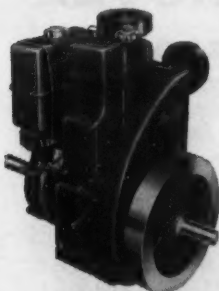
A structural steel frame forms the building above the street floor. Completion is scheduled for late this summer.

Men on the Job

Project manager for Crane Construction Co. is W. W. Brunson. Superintendent for Keller Construction Co. is J. C. Stone. Architects are Shaw Metz & Assoc. of Chicago, and the consulting engineer for foundations is A. W. Thompson of A. W. Thompson & Assoc. Mr. Thompson also designed the foundations and the first floor structure. Cushman & Wakefield, Inc., are managing agents for the building.



COMPLETING THE FOUNDATION — Workmen strip wood forms from the pile caps that were poured after all pipe struts were placed and excavation was completed.



Model SL1.
5½ HP @ 2250 RPM

AIR-COOLED DIESEL POWER

—by **Lister**

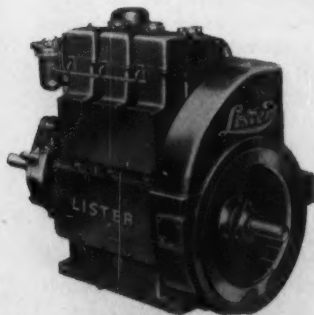
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AIR-COOLED DIESEL ENGINES
from 3½ HP to 72 HP.

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- Totally enclosed working parts to insure continuous operation even under adverse conditions.
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- Design simplicity reduces maintenance costs.
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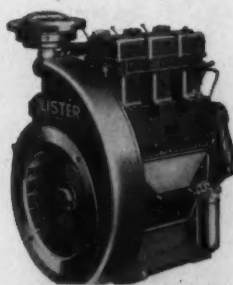
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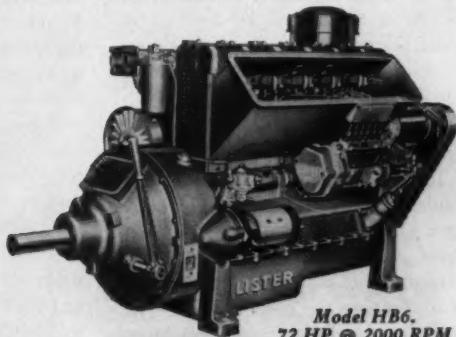
In Canada: Canadian Lister-Blackstone, Ltd., 1921 Eglinton Ave. East, Toronto 13, Ont.



Model SL3.
15 HP @ 2250 RPM



Model HB3.
36 HP @ 2000 RPM



Model HB6.
72 HP @ 2000 RPM



Breaking stone out of solid bank was Michigan's chore when rain-soaked shot failed to shatter basalt ledge. Rugged machine withstood test with no loss in production.

BIG RUBBER-TIRED TRACTOR SHOVEL ECONOMICALLY EXCAVATES AND HAULS SHOT ROCK

Output, 3600 tons daily on 600 ft cycle, enables Idaho contractor's one Michigan to replace "standard" shovel-truck fleet

The 4½ yd Michigan Model 275A Tractor Shovel you see here is, by itself, doing all excavating and hauling of shot rock on a highway re-location job in northwestern Idaho.

Breaks out rock from poorly shot bank

Its production on 300 ft one-way hauls, bank to portable crusher, averages 3,600 tons per 20-hour day, *excavated and hauled*. Contractor, Grant Construction Company, Coeur D'Alene, is thus saving the costs of the 1¼ yd rock shovel and two six-yard rear dump hauling units normally used on such a project.

"Our first test with the Michigan was

sure a rugged one," recalls Company President Jay Grant. "We had been using the machine to load crushed stone on another job. Never thought of trying it on this project (a \$613,000, 5.3 mile relocation of U.S. 95 near Lewiston, Idaho). Then our Michigan Distributor (Western Machinery Co, Spokane) told us how other rubber-tired Michigans had been cutting costs on shot rock applications in other locations. So we brought it in, figuring it would dig and load most efficiently in rock shot to 12-inch size. We drilled the basalt shelf accordingly. However, rain hit us before we could detonate the dynamite charge . . . and the shot gave us uneven

breakage with most of the-basalt remaining in the bank.

"But that didn't stop our Michigan! It moved into the bank . . . and pried out the solid rock (weighing in-the-bank, 4900 lbs/yd) as if it were loose material. The way the Michigan handled that job was the 'acid test' as far as we were concerned. For one thing, it sure convinced us we wouldn't need the rock shovel. We were right . . . today the Michigan is charging the crusher at a steady rate of 180 tons per hour, 20 hours per day . . . and there have been no delays due to downtime."

Special techniques help cut cycle time

Grant has developed some special techniques to shave valuable seconds off the Michigan's cycle time.

"We've found the most effective method of loading shot rock is not to 'ram' the bank . . . but to move in at a slow speed," explains the contractor.

"This enables the Michigan's excellent bucket pry-out action to do most of the initial work . . . reduces wheel spinning . . . and takes advantage of the torque converter drive machine's traction and hydraulic power."

A noticeable saving in loading time is the result. *Even from the solid bank* the 262 hp unit gets heaping buckets in 50 seconds or less. To further shorten cycle time, Grant's operator runs the Michigan both forward and reverse over the 300 ft haul (Michigan has same speeds both ways—up to 28 mph). This eliminates turning . . . has increased the number of cycles to 26 per hour.

Handles boulders too big for 45,000 lb crawler

Occasionally, Grant finds it necessary to pull the mobile Michigan away from its shot rock assignment to handle other tough highway construction tasks . . . such as prying huge boulders out of the roadbed that stymie even a 45,000 lb crawler.

According to Mr. Grant, the ruggedly-constructed Michigan is better at this job than a dozer because it can dig under the boulder, exert its powerful pry-out action to loosen the rock and then topple it over the road bank,

Only the Michigan Tractor Shovel is built to withstand such abuse. It'll do the same kind of job for you. Best way to find out is to ask your Michigan Distributor for a no-obligation demonstration—nine models available with buckets from 16 cu ft to 6 cu yds. Also four models of Tractor Dozers—162 to 600 hp . . . and a full line of Tractor Scrapers—12½ to 32 cu yds. Same rugged construction throughout all Michigan machines.



Grant reports that with proper operating technique, Michigan can dig a heaping 4½ yd bucketful of shot rock in average 45 to 55 seconds.



Michigan runs up 18 percent, 25 ft incline to charge crusher with 180 tons of stone per hour. Grant's highway project calls for 160,000 tons in all . . . all to be supplied by the Michigan.

Michigan's power shift transmission and identical speeds forward and reverse eliminate turning, cut valuable seconds off cycle time on haul between bank and crusher.



Michigan is a registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division

2403 Pipstone Road
Benton Harbor 10, Michigan

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Every Eaton "2-Speed" Trip is an ECONOMY RUN

Give truck drivers twice the conventional number of gear ratios—the *right* ratio for the immediate road and load condition—and savings in hauling costs mount up. Savings in running time—because trucks equipped with Eaton 2-Speed Axles make more, quicker full load trips. Savings in shop time—because Eaton 2-Speeds hold down maintenance, keep trucks on the road.

Eaton 2-Speed Axles also cut operating costs. With the right gear ratio for every operating situation—on or off the highway—engines run in their most efficient and economical speed ranges. Gas and oil consumption goes down; wear and tear on engines and all power transmitting parts are lessened. As a result, trucks last longer—and they're worth more when traded in.

EATON 2-SPEED AXLES



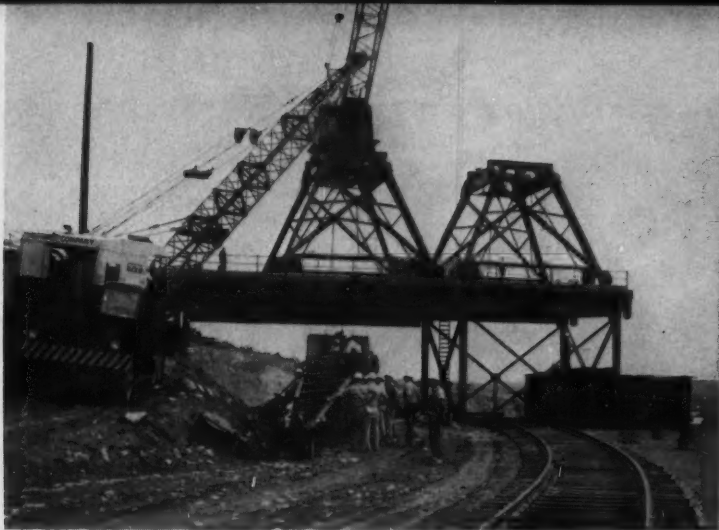
More than 2 Million
Eaton Axles in Trucks Today

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AXLE DIVISION
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ONE UP, ONE DOWN—Big Manitowoc on its gantry atop partially completed trestle prepares to hoist its partner to other gantry. Bucyrus-Erie crane is removing boom.

Two specially fabricated gantries mount 125-ton capacity cranes that pour all the concrete for Cowans Ford Dam. The gantries ride rails atop a 1,232-ft-long trestle.

Crawler Cranes Trade Tracks For Gantries to Work on Dam

TWO BIG CRANES have been lifted off their standard crawler mountings and seated atop gantries on a trestle to pour all concrete for Cowans Ford Dam near Charlotte, N.C.

By the time the project is completed, the 125-ton capacity cranes will have poured more than 350,000 yd for the \$62-million combination earthfill and concrete dam on the Catawba River. Duke Power Co., the owner, is handling much of the construction work with its own forces.

The two Manitowoc 4000 cranes were shipped separately to the job site by rail. When the first arrived, it was assembled on its crawler tracks and put to work. It helped build the cofferdams, erect a concrete batch plant, and unload steel for the trestle.

After erecting a portion of the trestle, the crane hoisted and positioned two gantries that had been especially fabricated by Manitowoc Engineering Co.

Shortly afterward, the second Manitowoc 4000 was delivered to the job. The assembled crane placed it on one gantry, then the gantry-mounted crane picked the first unit up off its crawlers and positioned it on the other gantry. Counterweights, a 90-ft boom and a 20-ft jib were attached to each crane after it was in position on top of the trestle.

From the gantry mountings, the two cranes helped to erect steel

continued on page 126



TRESTLE CONSTRUCTION—Cranes unload steel for the trestle from railroad flat car below. Gantry legs are mounted on trucks that ride 30-ft-gage tracks laid on timber decking.



Dodge heavy-duty trucks for 1961 are the toughest, stingiest, workingest trucks we've ever built. They all feature cab forward design that lets you put a bigger body on the same wheelbase. And swing-out fenders that make engine servicing a cinch. The heavy-duty Dodge engine lineup includes both gasoline and diesel models. Six and V8 gasoline engines to 228 hp. Tough Cummins diesels to 220 hp. Frames, clutches, transmissions and axles, job-rated to fit your needs. Heavy-duty Dodge cab forward trucks and tractors run from 28,000 lbs. to 53,000 lbs. GVW, and from 55,000 to 76,800 lbs. GCW—single axle and tandem. From top to bottom Dodge trucks are priced to compete with any truck made.

And one more thing. Our 24-hour-a-day, seven-day-a-week emergency parts system. When you need parts for a Dodge truck, you get them fast. SEE YOUR DODGE DEALER.

DODGE BUILDS TOUGH TRUCKS

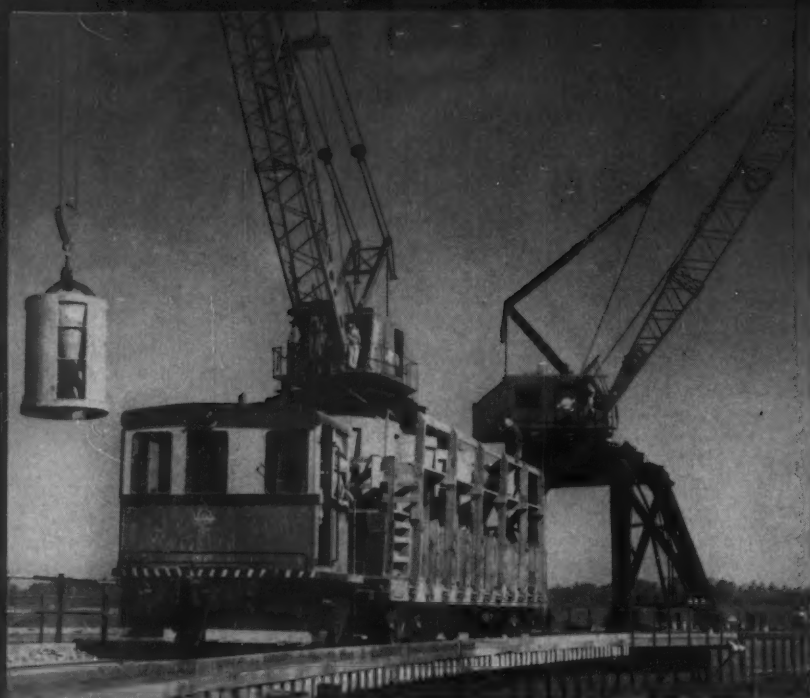
TOUGHEN YOUR FLEET WITH DEPENDABLE DODGE TRUCKS

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ALL-NEW DART PICKUP! First and only full-size truck with compact-economy. Comes with 7½' or 8' pickup box. Available with either 140 hp. inclined Dart Power Six or 200 hp. V8 engine. Priced to compete with any other truck you can name.

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MOVING CONCRETE—A 25-ton GE diesel electric locomotive pulls a flat car that carries three 4-yd Gar-Bro buckets along trestle between cranes and a Noble concrete plant.

CRANES TRADE TRACKS . . .

continued from page 123

for the remainder of the 30-ft wide, 1,232-ft-long trestle that spans the pour area. The trestle is supported by 15 tower sections founded on concrete piers. Ten of the towers are 30x35-ft, four are 24x30 ft, and one is 30x32 ft. The shortest span between the two towers is 51 ft and the longest is 61 ft. The trestle is decked with heavy timber.

The gantries ride on a 30-ft gage track atop the trestle. Each of the four legs of a gantry are mounted on a truck that rides on two 36-in. steel wheels. Gantry legs are 30 ft apart and clearance from the trestle to the gantry is 22 ft.

The same mechanisms that powers the cranes when they are on crawlers also moves the gantries. Instead of powering tracks, the chain drives power the wheels on all four trucks on each gantry. Maximum rail travel speed of the gantries is 200 ft per min.

Concrete is brought in by four flat cars pulled by 25-ton GE diesel electric locomotives that switch back and forth on two sets of railroad tracks laid on the trestle. There is enough space between the supporting legs of the gantries for two flat cars to pass underneath at the same time.

To expedite pouring, a flat car

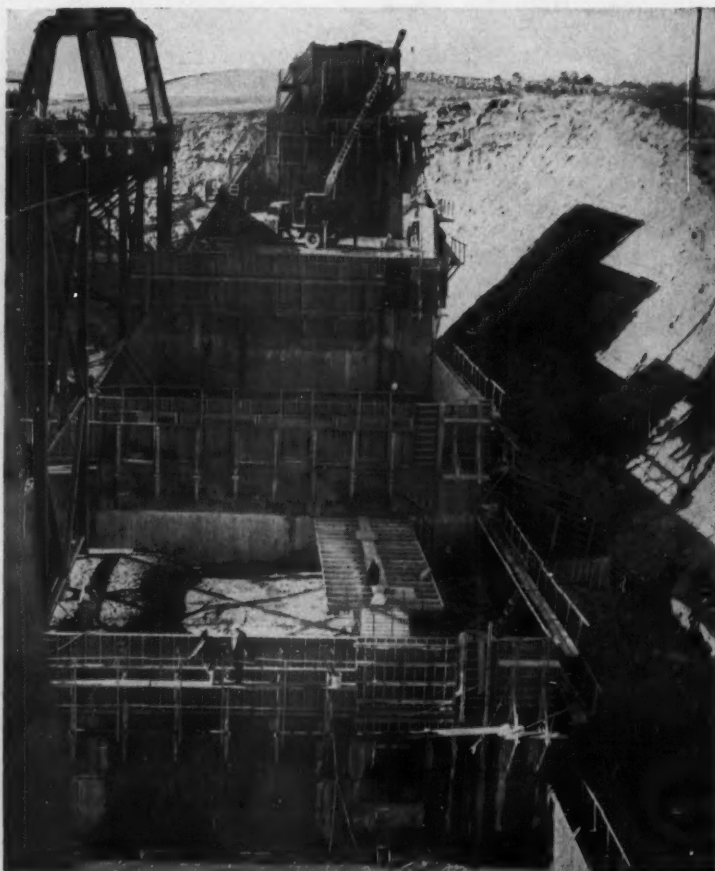
loads only three 4-yd Gar-Bro buckets at the batch plant even though there is room for a fourth bucket. When the flat car returns to the pour area, a crane places its empty bucket on the car and picks up a filled one. As soon as the last filled bucket is hoisted away for the pour, the flat car goes back to the batch plant with three empty buckets. With this system, one crane can pour up to 100 yd of concrete an hr.

Duke is pouring the 1,280-ft-long concrete section of the dam is 26 monoliths of varying width. Concrete is being placed in each monolith in 7½-ft-lifts.

Blaw-Knox cantilevered steel forms are used for the pours. Some of the forms are adjustable for the curvature of the spillway face; others are designed for the straight slopes on bulkheads, and still others are non-adjustable for vertical surfaces.

The first pour, which brings the concrete clear of the rock founda-

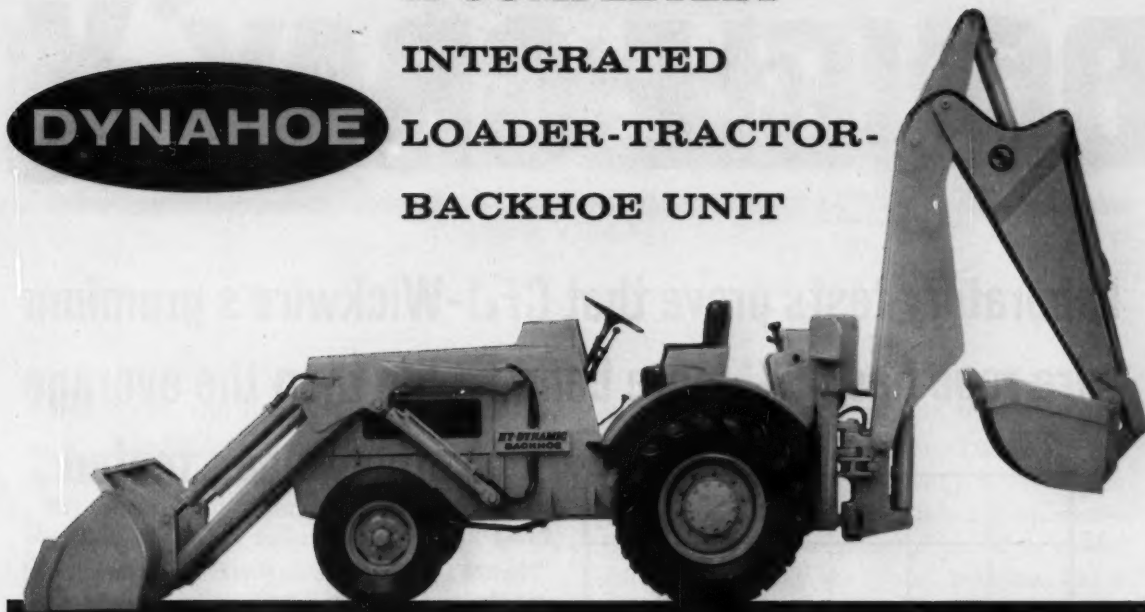
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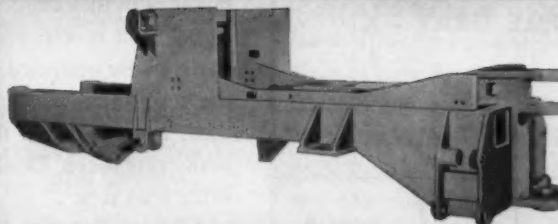
RAISING FORMS—A truck-mounted 3-ton Bucyrus-Erie Hydrocrane helps strip and raise 7½-ft cantilevered Blaw-Knox steel forms after the concrete has cured for three days.

DYNAHOE

A COMPLETELY INTEGRATED LOADER-TRACTOR- BACKHOE UNIT



A NEW
CONCEPT
IN MACHINE
DESIGN...



Massive Foundation
Frame. Only this design can provide the stamina and strength so vital to successful heavy duty Backhoe performance.

Designed and Built by men with many years of experience

SPECIAL EXCLUSIVE FEATURES

Unit Construction: The complete Loader-Tractor-Backhoe is built as ONE INTEGRATED UNIT... differing completely from machines consisting of a standard tractor to which loader and backhoe attachments have been added.

New Operating Advantages: Extremely easy to handle... unusual visibility for both backhoe and loader operations. Operator's seat quickly pivots to either loader or backhoe controls. Either 4 or 6 handle backhoe controls.

Extremely Heavy-Duty Construction: All major component parts, such as frame, buckets, booms, dipper, etc., are exceedingly heavy duty.

Good Traction: Maximum tire flotation is provided in BOTH front and rear axles.

Oversize Pins and Bushings:... for greatest strength and wear... Zerk fitting lubricated.

Fast Swinging and Digging: Adequate hydraulic power guarantees especially fast backhoe boom swinging and digging action.

Loader Bucket: ¾ yd. struck.

Backhoe Bucket: 7.8 cu. ft. std. Digs 14 ft. deep.

Adequate Cooling: Oversize radiator, fan and hydraulic oil coolers prevent overheating of oil or water under all conditions.

Exclusive Design: The only machine engineered as a single, completely integrated Loader-Tractor-Backhoe unit.

Power Steering: Easier to drive on the road and to operate in the field. Adequate weight on steering wheels for 18 to 20 m.p.h. highway travel.

Transmission: 3 speed with torque converter and power shift forward and reverse provides easier, faster operation for all backfilling and loading jobs.

Buckets:... are of extra heavy construction. Bucket teeth with replaceable caps on Backhoe.

Weight Distribution: The unit has proper weight distribution on both rear and steering axles to provide the best flotation, operating and best highway driving characteristics.

Heavy Planetary Rear Axle.

65 H.P. 6 Cyl. Engine.

For further information and the name of our nearest distributor, phone or write:

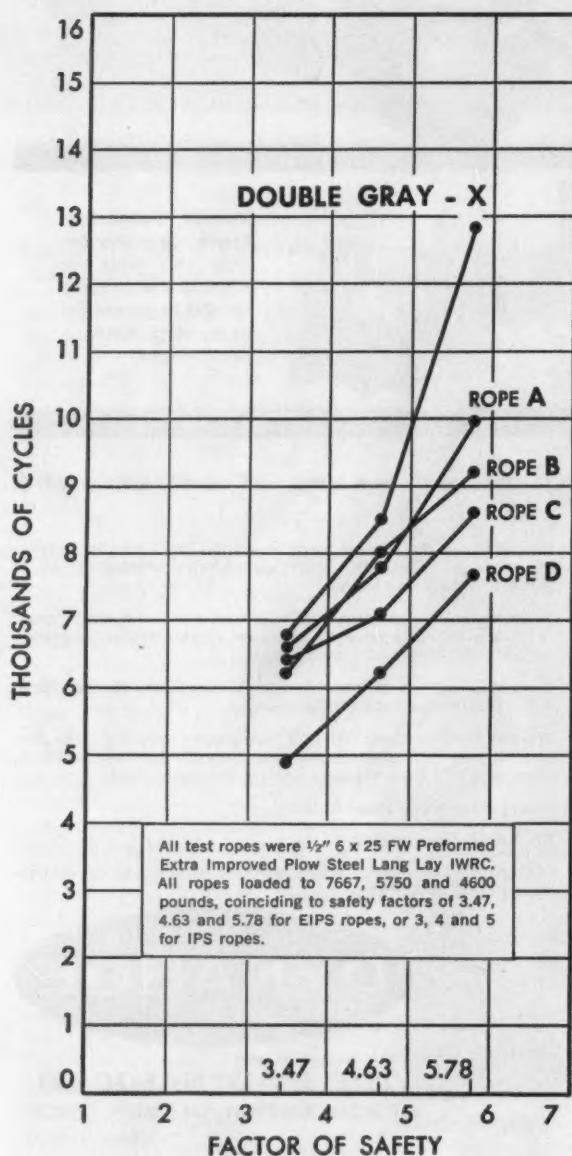
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DOUBLE GRAY-X[®]

Laboratory tests prove that CF&I-Wickwire's premium wire rope has 45%* more bending life than the average of other ropes tested



The CF&I-Wickwire engineers who developed Double Gray-X *believed* in their product. So confident were they of its superiority that they decided to field-test prototypes of Double Gray-X as soon as they were perfected. In the months that followed, the top American firms chosen to participate in these tests delivered this verdict: when the going really gets tough, Double Gray-X lasts longer than other wire ropes.

Now, CF&I presents additional proof that Double Gray-X has *superior resistance to bending fatigue*, the chief enemy of wire rope life. In an extended series of tests conducted over the past year at CF&I's Palmer Plant, Double Gray-X proved itself superior to four other wire ropes, all made by major manufacturers.

HOW WERE THE TESTS CONDUCTED?

The five wire ropes tested—all identical in size and specification—all exceeded the catalog breaking strength of extra-improved plow steel ropes. Each rope was subjected to the same series of tests on a 25,000-pound, multiple-reeved fatigue machine, the largest of its kind. This machine punishes wire rope to destruction by bending it back and forth over sheaves.

*Percentage above average of all other wire ropes tested at safety factor of 5.78

lasts longer

WHAT WERE THE RESULTS OF THE TESTS?

As the chart indicates, Double Gray-X lasted longer than any of the four competing wire ropes at all the safety factors used in the test. At the highest and most commonly-used safety factor, Double Gray-X lasted 30% longer than the rope that lasted next longest, and 68% longer than the rope that lasted the shortest time. Double Gray-X lasted 45% longer than the average of all other wire ropes tested at this safety factor.

WHY DOES DOUBLE GRAY-X LAST LONGER?

It lasts longer because it's the result of a breakthrough in wire-drawing technique. This new process, which includes the use of molybdenum disulphide, creates these outstanding fatigue-resistance factors in Double Gray-X:

- **A Molecular Shield** — Molybdenum disulphide creates a shield around every wire, which serves as a lubricant and prevents the wires from grinding together as the rope operates. Less internal friction results in longer rope life.
- **Smoother Wire Surface** — CF&I's new wire-drawing technique helps eliminate minute surface imperfections in the wire. This smoother surface provides better resistance to fatigue.
- **Extra Toughness** — Molybdenum disulphide lubricates the wires during the drawing process. Since less power is required and less heat generated during this operation, the original toughness of the wires is better preserved.

WHAT CAN DOUBLE GRAY-X DO FOR YOU?

It can save you money. Because Double Gray-X lasts longer on even the toughest jobs, it cuts wire rope repair and replacement costs and rope-installation time. The net result to you is an overall reduction of costly equipment downtime, and a lowering of your total wire rope investment.

As a matter of fact, those of our customers who have already bought and field-tested Double Gray-X have reported considerably longer life and less downtime on their equipment. Join these satisfied customers—try Double Gray-X on *your* equipment right away. Ask your CF&I salesman to give you complete details on these tests.



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0100



DRILLING—Powerhouse excavation requires the removal of 400,000 yd of rock. Here, drills with carbide-bits make blast holes.



CRUSHING—Cedarapids 42x48 jaw crusher gets a load of boulders from a Euc dump truck. Conveyor will carry rock to surge pile.

tion, is only 3 ft 9 in. high. This pour goes into wood forms built on the job. For the next lift, which is the normal 7½ ft, the steel forms are secured to the wood forms.

Air-operated gates at the bottom of the buckets control the placement of concrete. Crews work the mix with Dart 4½ and 6-in. vibrators.

Pouring proceeds by the cascade method, one monolith at a time across the face of the dam. Forms are stripped and raised every three days with a truck-mounted Bucyrus-Erie 3-ton Hydrocrane that works from the top of a monolithic section and reaches down over the side. The Hydrocrane is shifted about by one of the Manitowocs. A garden hose with holes punctured in it is laid on the freshly poured concrete and keeps it wet for curing.

Close Cooperation

While Duke is relying heavily on its own forces, the construction of the 130-ft-high, 7,387-ft-long dam requires close cooperation between the utility and a construction firm. W. E. Graham & Sons, a division of Vulcan Materials Co., Inc., of Birmingham, Ala., is building the east and west earthfill portions of the dam and excavating rock from the powerhouse and tailrace areas.

Graham also is operating the 300-tph aggregate plant that Duke owns and erected on the site. Considerable teamwork between the two groups is necessary because all aggregate for the job is being processed from material exca-



HEAPING—A handy Scoopmobile with a front-end bucket maintains the sand pile.

vated for the powerhouse. So far, aggregate supply has kept well ahead of demand.

Graham is excavating 400,000 yd of rock, most of it diorite and granite. Some of the rock will be used for riprap on the upstream face of the earthfill and the rest will be used as aggregate.

The contractor has a total of nine Gardner-Denver and Ingersoll-Rand drills with 2¾-to-3-in. dia carbide bits to make blast holes. The drills are powered by I-R 600-cfm compressors. The holes are sunk in a 6x7-ft grid pattern up to 60 ft deep.

The holes are stuffed with American Cyanamid 60% gelatin dynamite. About 1 lb of explosive is used per 1 yd of rock. Graham usually pulls about 14,000 yd of shot rock per blast.

Two Northwest 2½-yd shovels load six Euc 11-yd trucks that haul the rock away. Most of the rock is taken directly to the aggregate plant, about 1,000 yd from

the excavation. Oversize boulders are reduced with a headache ball before being transported to the crusher.

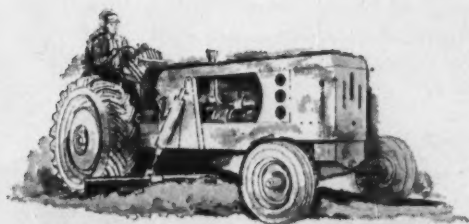
The 300-tph aggregate plant consists of a Cedarapids 42x48 jaw crusher, a Symons 4½-ft-cone crusher and 4-ft short head cone crusher, an Eagle sand classifier, and Cedarapids screens and conveyors. The plant is capable of stockpiling four different sizes of stone, plus sand. One storage pile contains 3 to 6-in. stone; the next, 1½ to 3-in. stone; the next, ¾ to 1½-in. stone; and the fourth, ¾-in. to No. 4 screenings.

There are two sources of sand. Some comes from the material that passes the No. 4 screen in the crushing plant. The other source is raw river sand that was pumped directly from the Catawba with an Ellicott dredge before the placement of cofferdams. The two materials are blended and passed through an Eagle sand classifier and unwatering screw. An agile Scoopmobile that mounts a front-end bucket works around the sandpile to keep the material properly heaped.

Syntron Feeders move the stockpiled material onto a tunnel conveyor that carries it to a rinsing plant and then on up to a Noble 200-yd-per-hr concrete plant. To make the concrete more workable, fly ash is added in amounts equal to 25% of the total cement content. The fly ash is transported to the site by rail from a steam generating plant about 6 mi away. Pozzolite is also added to the concrete.

continued on page 135

*Real versatility...
nine machines
in one*



Whether it's street, road or highway, maintenance or on construction jobs, versatility is important. The fewer machines needed to complete the job, the lower the overall costs. Versatility is one of the reasons the Huber-Warco M-52 Maintainer, with power sliding moldboard and torque converter, is so popular throughout the world. This power-packed 45½ H.P. workhorse is a real profit maker . . . virtually nine machines in one. Time and time again maintainer owners have remarked on the ability of their M-52's to outperform machines that are larger, heavier, more expensive and more costly to operate. The M-52, with hydraulically controlled attachments, can be used year 'round as a grader, lift-loader, scarifier, bulldozer, broom, side dozer, patch roller, snow plow or berm leveler. Why not see your Huber-Warco distributor at your first opportunity — he'll be glad to give you all the details as well as a demonstration.

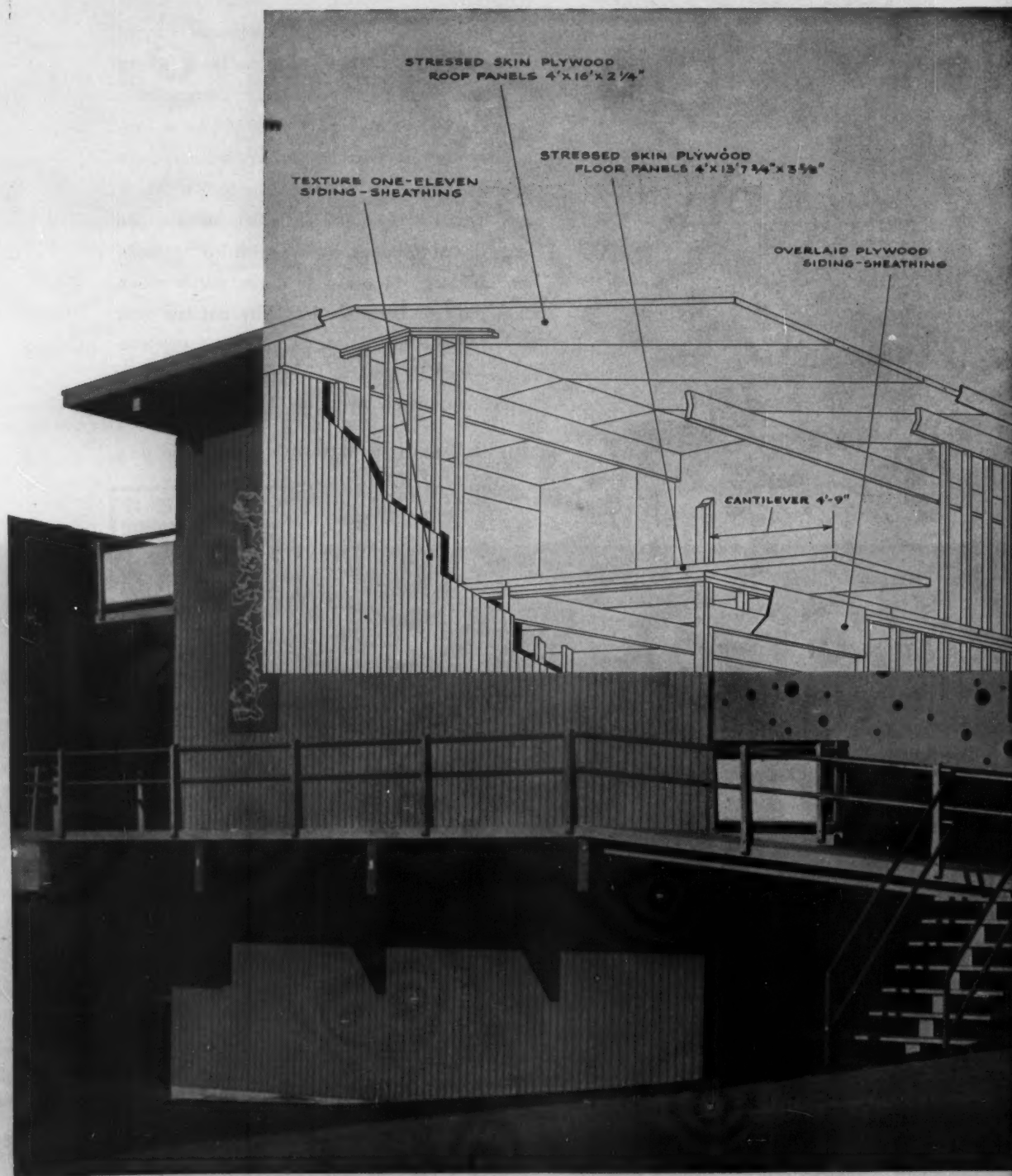
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**BUILT
FOR
PROFIT**



Fir plywood components and cut over-all costs 15%



"Sturd-i-wall" construction on 26-unit apartment

Two relatively new time-saving techniques keyed to the use of fir plywood were credited with saving \$16,000 on this apartment project. It cost some 15% less than comparable construction using other materials.

Stressed skin plywood components cut labor 75% compared with conventional roofing and flooring methods. Precisely engineered and factory fabricated under controlled conditions, panels had fir plywood top and bottom skins pressure glued to light lumber framing, with insulation sandwiched inside. Used at all three levels, they provided ceiling and underlayment or ceiling and roof decking in one unit.

Plywood stressed skin components like these offer maximum strength with minimum bulk. Their use is growing on buildings of this size and larger, for struc-

tural superiority and sharp reductions in on-site labor—in some cases as much as 85%.

"Sturd-i-wall" construction (one layer of plywood as combined siding-sheathing) was the other cost cutter, saving an estimated 15% on wall costs. Texture One-Eleven® (vertically grooved) plywood and medium density overlaid plywood were nailed directly to studs. The Sturd-i-wall system has proved its strength and economy in home building. As seen here, it offers comparable advantages in larger projects as well.

For more information about fir plywood, write (USA only):

DOUGLAS FIR PLYWOOD ASSOCIATION
TACOMA 2, WASHINGTON

— a non-profit industry organization devoted to research, promotion and quality control



Stressed skin panels have wiring run through; insulation and soundproofing are excellent. Panels are light, easily handled by two men.

Texture One-Eleven nailed to studs made a stronger, more rigid wall than one with conventional sheathing and siding—in half the time.



TILlicum APARTMENTS
LOCATION: Winslow, Wash.
ARCHITECTS: McCool & Morgan, Seattle
CONTRACTOR & OWNER:
Edmund Stafford, Winslow
COMPONENT FABRICATORS:
Panelbild, Lynnwood, Wash.

REACH
AND
DUMP
HEIGHT
LIKE
THESE

PUT
MORE
IN THE
TRUCK
AT
LOWER
COST



New ML-309 "Moto-Loader"® designed to *your* specifications.



An ML-309—18,000 lb. lift capacity—equipped with a 3-yd. bucket loads out rock at the Lincoln Stone Quarry, Joliet, Illinois.

Before Lorain engineers put pencil to paper to design this latest Lorain Moto-Loader, users were surveyed to find out the features most wanted in a machine of this class. Maximum dump height and forward reach at that height were high on the list.

Lorain came through. Dump height of the ML-309 is 10' with 16x24 tires, 10'x3" with 18x25 tires. Forward reach at 10 ft. dump height is 3'6".

It is here, where the work is done, that the Lorain ML-309 pays off; lets you load the big, high trucks fast and efficiently, with an even spread, for maximum profit.

Of course, there are many other fine features in the ML-309. A few are:

4 speeds and full power shift with Lorain's "Moto-Matic" simplified and easy-to-service transmission.

"No hands" forward and reverse. One foot controls travel directions and speeds—frees hands for other operations.

Safety arms. Never a hazard. Excellent side vision.

One piece full-depth frame of heavy, welded sections won't deflect or twist.

New bucket design produces boiling action that fills even in the back corners; produces proper crowning for non-spill carry.

There are many more that can be described by your nearby Lorain Moto-Loader distributor. And ask him for a demonstration. Stack up the "309" against anything in its class. This is the real way to find out how all Lorain features are "balanced" for maximum production.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

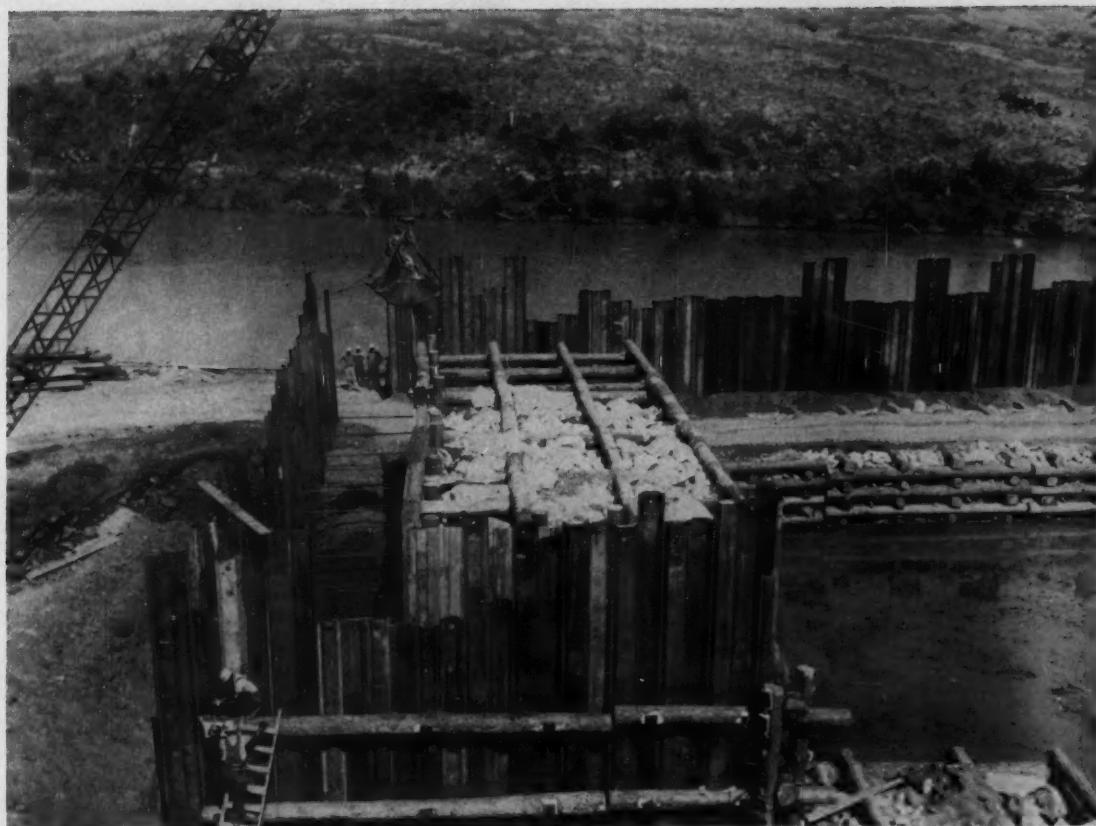
LORAIN®

Does more, faster, for less

PLANTS in Lorain and Elyria, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawlers from $\frac{3}{8}$ - to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 11,000-lb. to 18,000-lb. lifting capacity.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.



CRANES TRADE TRACKS . . . continued from page 130

Early Work

A. P. White & Associates of Charlotte built the cofferdam and earthfill portions of the project to divert the river. The cofferdam area extends about two-thirds of the way out into the river bed. The swift flow of the river as it funnels into the narrowed area created a shore erosion problem.

Duke crews took special precautions to prevent the section of the earthfill area that runs parallel to the river from washing out. Along its 283-ft length, they constructed 28-ft-high log cribs and filled them with boulders and large stones. The average crib size was about 22x22 ft, made of 12 to 18-in.-dia logs. Ends of the logs were bolted together and in some cases they were notched to make a tight fit.

Next, Bethlehem DP-2 and U.S. Steel MP-116 sheet piling was driven 10 ft outside the log cribbing. Tie rods connected the sheet piling with vertical log members of the cribbing above the water

line. Other logs served as walers outside the piling. The area between the sheet piling and the cribbing was filled with clay.

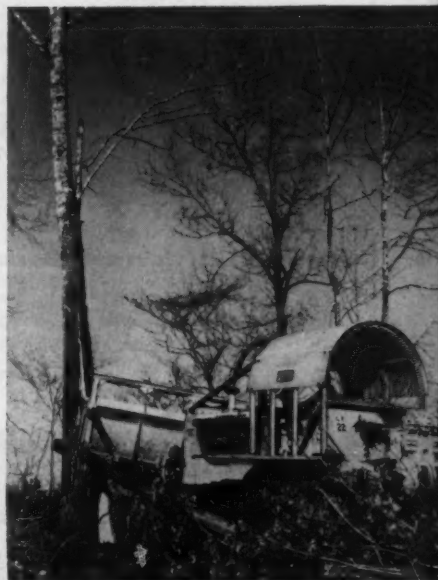
Another level of log cribbing was built on the river bottom outside the sheet piles. This cribbing, which was also filled with boulders and earth and compacted to create a road, was constructed to a height slightly above maximum high water for the river. It braced the under water portion of the sheet piles.

All lumber used on the job, including wood forms and log cribbing, came from the 24,000 acres of land cleared for the reservoir by Duke's forestry department. A fleet of Caterpillar, International, and Allis-Chalmers crawler tractors handled the bulk of the clearing operation.

Cowans Ford Dam and powerhouse is slated to go into operation in 1963.

For Duke, C. E. Watkins is construction manager and R. L. Dick is resident engineer. Fred M. Moore is superintendent for Graham.

CRIBBING—Log cribs filled with boulders prevent shore erosion. Area between cribs and sheet piles, which are driven 10 ft outside the cribbing, is then filled with clay.



CLEARING—Cat D8 with Fleco protective cab clears land for reservoir. Timber cut from 24,000 acres was processed and used for forms and other lumber on the job.

Better service accessibility alone makes the "Euc" C-6 your best tractor buy

In the Euclid C-6 crawler you get the advantages of job proved components and years-ahead engineering that keeps down-time and operating cost to the absolute minimum. You get unitized assembly of major components and service accessibility that is unsurpassed by any crawler . . . replacement labor costs are well below those for comparable tractors. For example, complete removal and replacement of a C-6 radiator takes less than one third of the time required for the same work on a competitive machine.

With easy accessibility for servicing and maintenance, the C-6 gives more work-time on the job . . . steps up production . . . helps beat the profit squeeze by cutting operating costs to a new low.

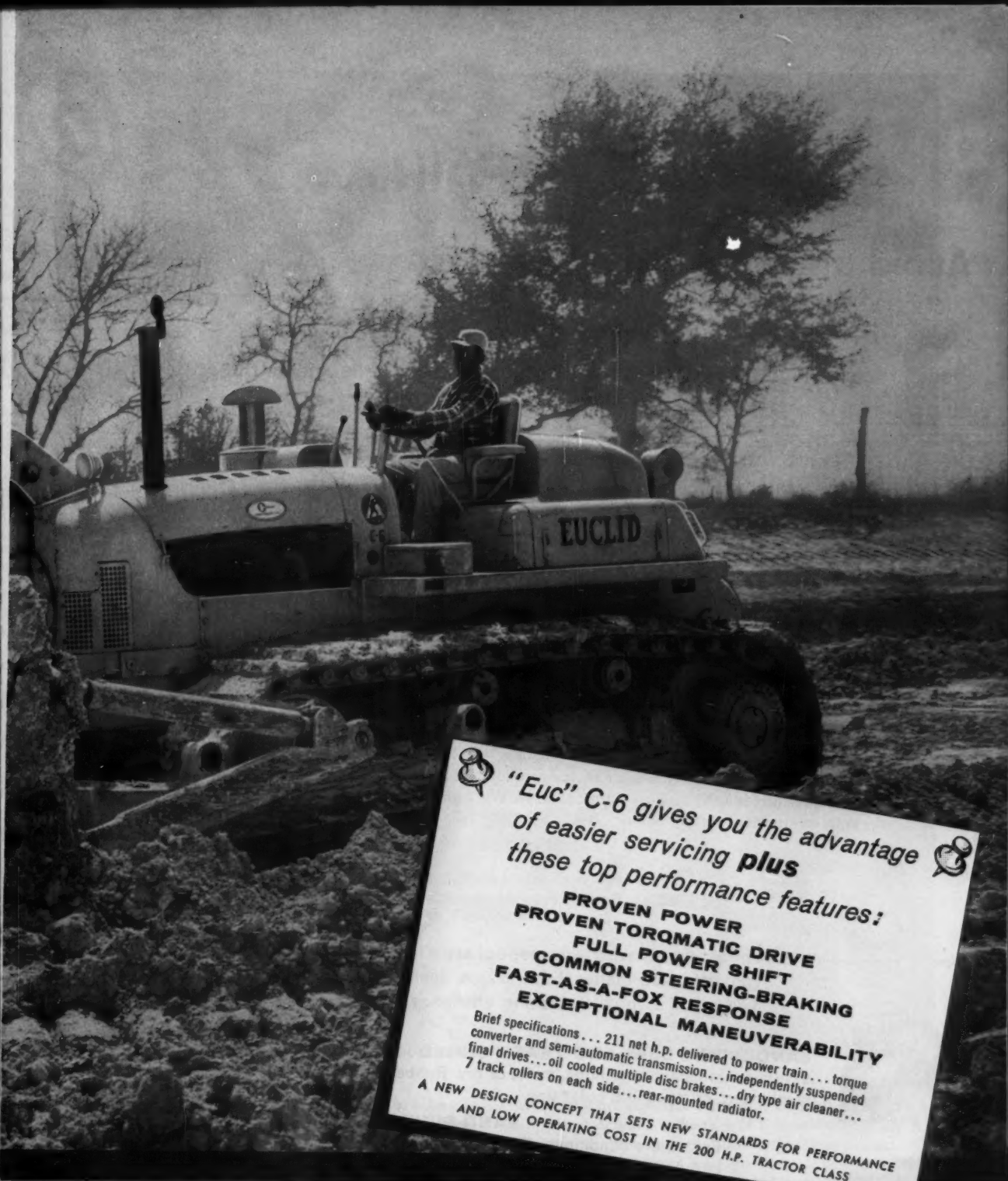
EUCLID Division of General Motors
Cleveland 17, Ohio

*Plants at Cleveland and Hudson, Ohio
and Lanarkshire, Scotland*



*Full-power shift...this Euclid C-6
crawler responds like nothing
you've ever touched!*

**Get all the facts and figures on
the C-6 . . . you'll find low operating
cost plus proven reliable performance
make it your best tractor investment.**



“Euc” C-6 gives you the advantage of easier servicing **plus** these top performance features:

PROVEN POWER
PROVEN TORQMATIC DRIVE
FULL POWER SHIFT
COMMON STEERING-BRAKING
FAST-AS-A-FOX RESPONSE
EXCEPTIONAL MANEUVERABILITY

Brief specifications... 211 net h.p. delivered to power train... torque converter and semi-automatic transmission... independently suspended final drives... oil cooled multiple disc brakes... dry type air cleaner... 7 track rollers on each side... rear-mounted radiator.

A NEW DESIGN CONCEPT THAT SETS NEW STANDARDS FOR PERFORMANCE AND LOW OPERATING COST IN THE 200 H.P. TRACTOR CLASS



EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE

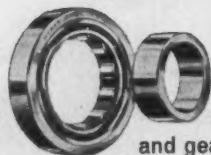
PM^{*} or REPAIR...

Avoid unplanned downtime . . . Keep rolling equipment on the move; keep stationary units and tools in operation by making necessary bearings replacements with New Departure Ball and Hyatt Roller Bearings. They have become the standards of the industry because of their reliability and long life under the most severe service conditions.

Whatever the reason for equipment being out of service and in the shop, the important thing is to get it on the job quickly and keep it working. New Departure and Hyatt Bearings help you do it. These top quality, precision bearings are close at hand through the national network of Authorized New Departure and Hyatt Distributors.

*** Preventative Maintenance**

HYATT

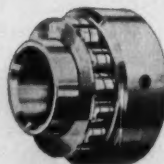


roller bearings come in a wide variety of types and sizes from $\frac{3}{4}$ " OD to 14" OD. They handle radial loads of up to 103,000 pounds, speeds as high as 50,000 RPM. Standard bearings operate efficiently from below zero temperatures to 450 degrees F. Special steels, if desired, push the temperature range higher.

METRIC SERIES . . . Precision roller bearings for transmissions and gear boxes with built-in extra capacity. Will handle heavy radial loads, with intermittent thrust loads.

WOUND ROLLER

. . . Made in all sizes, operates with inner race or directly on shafting. Resists extreme shock, abrasion and fatigue.



NEW DEPARTURE

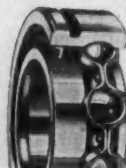
ball bearings have a wide range of seals to retain bearing lubricants and keep out contaminating matter. Each seal is designed as an integral part of a bearing. The result is greater bearing efficiency, less downtime, longer life.



LAND-RIDING SEAL AND TRASH SHIELD . . . Excellent for severe contaminant conditions, moist or dry. Rubber is bonded to steel insert, crimped into outer ring.

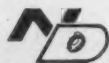
LAND-RIDING SEAL, PRESSED . . .

For severe conditions. Rubber is bonded to rigid steel "L" frame and pressed into outer ring ID for positive seal.



SENTRI-SEAL . . . Most popular seal in use today. For every contaminant condition. Metal insert, molded in rubber seal which has positive contact with ground inner ring groove.

HYATT



NEW DEPARTURE

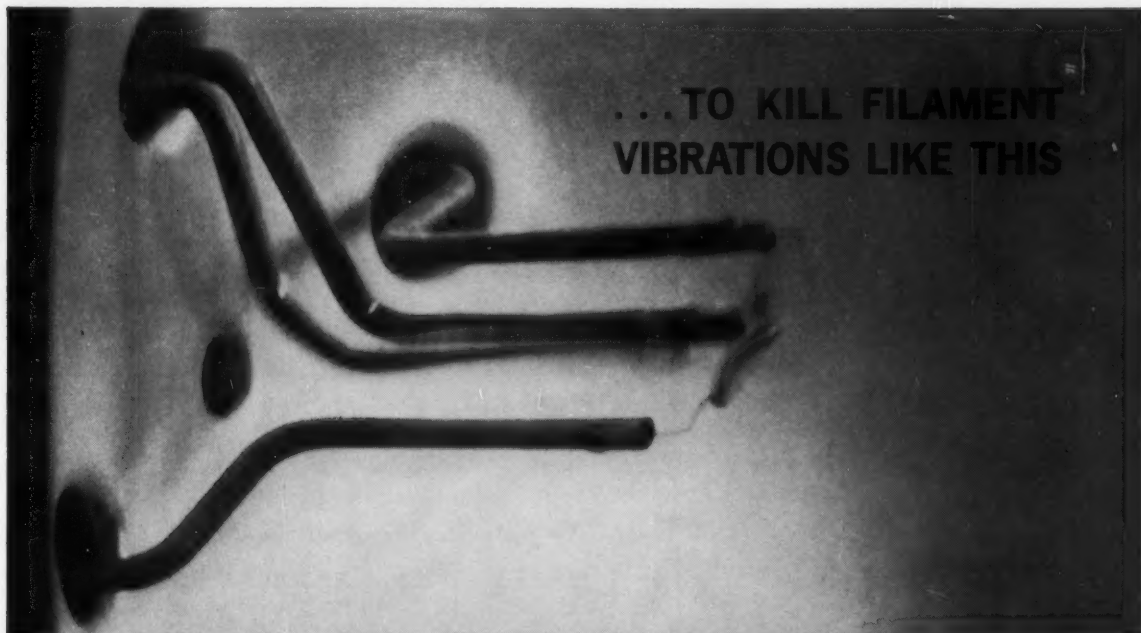
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Circle 138 on Reader Service Card



CONSTRUCTION METHODS



...TO KILL FILAMENT
VIBRATIONS LIKE THIS



NEW GENERAL ELECTRIC
MACHINERY LAMPS
HAVE THIS CERAMIC
SHOCK ABSORBER

Unretouched enlarged photos of portion in rectangle below.



These photographs show why the filaments in the new General Electric construction machinery lamp (bottom photo) can last up to three times as long as those in old style lamps (top photo). Although both lamps are being subjected to the same vibration in this test, the ceramic shock absorber in the new G-E lamp holds the

lead wires steady. Much less road shock and engine vibration are transmitted to the filaments, so they last longer.

The new G-E lamps with this ceramic shock absorber cost no more than the old style sealed beam construction lamps you're now using. These new construction equip-

ment lamps are available from your General Electric lamp supplier. Ask him for the new G-E lamps with the shock absorber . . . the lamps that last longer than the old style construction lamps but cost no more. These are headlamps #4480 (12-volt) and #4880 (24-volt) and floodlamps #4478 (12-volt) and #4578 (24-volt). General Electric Co., Miniature Lamp Dept. M-120, Nela Park, Cleveland 12, Ohio.

Progress Is Our Most Important Product

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EXPLOSIVES



ENERGY...

Have you checked into the many ways it can handle work that used to be done with mechanical energy . . . and do it cheaper, faster, more efficiently?

Lower TOTAL job costs can be your reward for examining ALL the ways in which explosives energy can work for you. For example, the J. A. Tobin Construction Company of Kansas City, Kansas did just this. On a section of the Turkey Creek Expressway, Interstate 35, there were no nearby homes or confining obstacles, so the objective was maximum breakage and production on every shot, together with efficient use of equipment. Granite ammonium nitrate blasting agent was chosen for the task—low cost, ready to load, but with the wallop needed to do the job.

For this contractor, selection of the right primers, blasting agents, and blasting techniques meant more thorough and consistent breakage and more payload work out of each piece of his equipment, and minimum downtime from end to end of the job. This is just one example of efficient use of explosives energy. Others? . . . of course!

In coal stripping . . . with the help of the Atlas Representative, one operator discovered a way to eliminate almost one-half the total mechanical handling of overburden. He used explosives force to move rock directly to the spoil pile.

In open pit ore mining . . . production has been speeded, costs cut by "designing" the blast to create additional fragmentation,

allowing much of the rock to bypass the primary crusher.

In quarrying . . . deliberate planning for thorough blasting (more than "just enough") saves more than its cost in reduced wear on crushers, wire rope, shovels—the whole gamut of equipment.

Efficiencies, and therefore savings, like these are available to you. Your Atlas Representative is both experienced and skilled in achieving these results in a wide variety of blasting conditions. There's no secret, unless it's knowing how to use the right combination of Atlas explosives, blasting agents (including *all* forms of ammonium nitrate), and blasting supplies for each job.

If you haven't checked your blasting methods lately, perhaps there's a new one Atlas can tell you about—the one that may be exactly the answer to help you reduce your overall costs. Look to Atlas' full line—the only full line in the industry. New, modern facilities are now in production at Joplin, Missouri to assure ready availability of all products. And to give you faster, more flexible local service, new distribution facilities are being established coast to coast. For assistance, call in your Atlas Representative, or write directly to:

ATLAS POWDER COMPANY
Explosives Division • Wilmington, Del.



ATLAS EXPLOSIVES

This Tamper  is too much fuss

Just like this tired old Bus



It was good enough for father



But this one is less bother . . .



NEW CM-10

For satisfaction contact Vibro-Plus.

It may be a little corny to sing the praises of a new machine in poetic style, but it is difficult to get across the terrific reception the Dynapac CM-10 received from the contractors who were kind enough to field test it for us. It travels faster, handles easier, and is much less balky. Prove it to yourself. Contact your nearest Vibro-Plus distributor for a demonstration of compaction ability.

THE NEW DYNAPAC CM-10

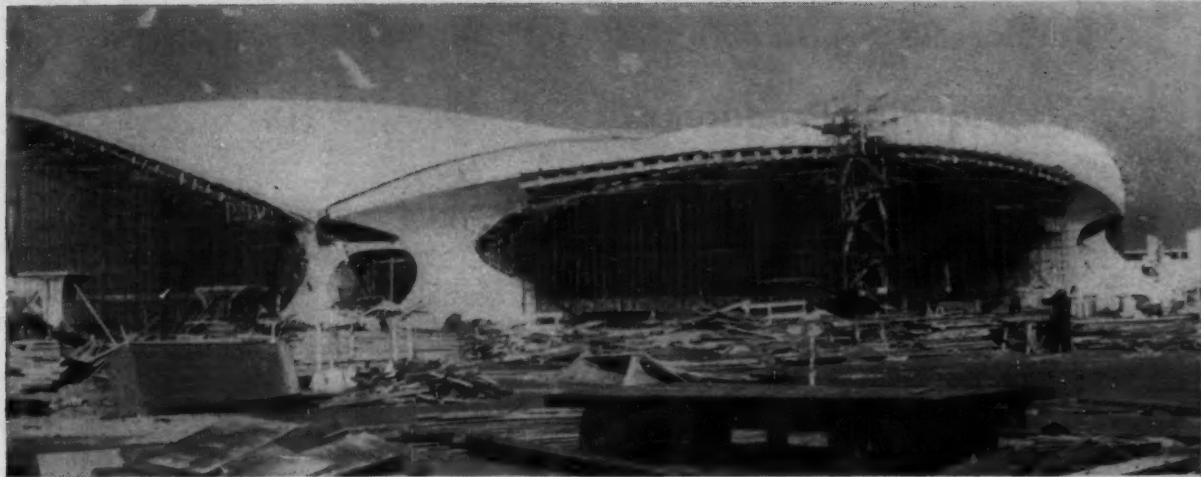


VIBRO-PLUS PRODUCTS, Inc.
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WORLD'S LEADING MANUFACTURER OF VIBRATORY EQUIPMENT FOR OVER TWO DECADES.

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An Acre of Precut Forms Molds Four Rigid Shells

All four shells making up the roof of the TWA Terminal at New York's Idlewild Airport had to be formed as a unit, and concrete placement had to be evenly balanced. The contractor made sure that each step was coordinated into an overall plan before actual construction began.

MOLDING the sculptured concrete of the Trans World Airlines Unit Terminal at New York International Airport called for extensive pre-construction planning, elaborate forming and carefully controlled concreting.

Prime contractor on the complex, \$12-million project is Grove, Sheperd, Wilson & Kruge, Inc., of New York.

The huge umbrella roof consists of four rigid shells supported by four massive buttresses. It covers $1\frac{1}{4}$ acres and weighs about 6,000 tons. Overall span of the roof along its long axis is about 300 ft. The two largest shells cantilever out from the buttresses more than 80 ft.

Thickness of the shells varies from 6 in. at the ridge lines to about 36 in. at the buttresses. Inclined edge beams separated by 3-ft-wide openings for skylights border the intersections of the shells, which are independent except for a concrete plug at the crown of the umbrella. Geometry of the structure is so complex that the three-dimensional surfaces where edge beams and buttresses flow together are mathematically undefined. There's no other word for this than sculpture.

GSW&K's project engineer, Vladimir Petrovitch, sums up the job this way: "Because of the complex shape of the structure, designing the forms was a tough job.

We aimed at a forming scheme that would make the actual construction as easy as possible. This meant fitting each step in the forming process into a coordinated job program.

"In our field office, a team of five engineers worked full-time from the start of the project preparing more than 600 working drawings. They had to compute the precise elevation of the shell at some 400 key points. These points, together with a grid system on which the falsework was laid out, controlled the positioning of all shell forms.

"Allowable tolerance was only $1/16$ in., so everything had to be exact. Computer Usage Co. of New York saved us a lot of time by handling some of these calculations."

At the Start

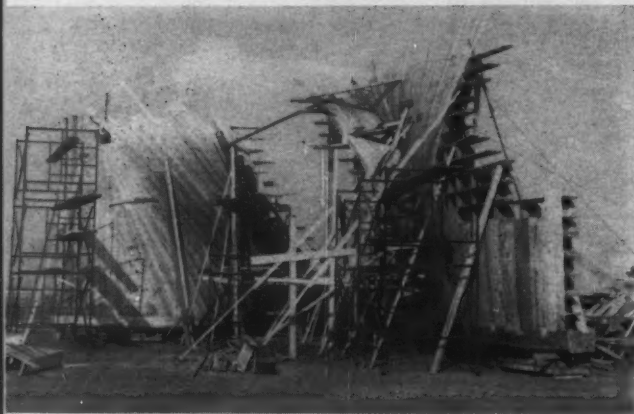
While preliminary engineering work was going on, a GSW&K crew began driving piles to support the four buttresses and the foundation slab of the three-story independent structure that the umbrella covers. Another crew began forming the four pre-stressed tie beams that link the buttresses at the bottom and counteract the thrust of the shells. Stressteel Corp. of Wilkes-Barre, Pa., handled post-tensioning of the $1\frac{1}{4}$ -in. bars prestressing each tie beam.

continued on next page



TAKING SHAPE—Forms that will mold concrete of four shells take on final shape of umbrella roof. Building is 300 ft long. Shells cantilever 80 ft out from buttresses.

Planning Produces Slick Forming Scheme



FORMING BUTTRESSES—Carpenters mold sheathing over panels assembled on grid system to form buttresses that will support shells.

Form work for the curved buttresses was as tough as any on the job. Carpenters constructed each of the four buttress forms in a yard adjacent to their shop. They assembled more than 400 panels on a precisely-laid-out grid system. Each panel covered an area of about 20 sq ft. Horizontal 2x12-in. ribs and 2x6-in. walers backed up the panels. Sheathing was 3/4-in. spruce. A flatbed truck transferred the form sections to the building site where they were set in place by a crane for the pour.

A Forest of Falsework

As soon as foundation work was completed, a crew began erecting tubular steel scaffolding to support the shell forms. Where the cantilevered shells jut out beyond the foundation slab of the interior structure, a pile-supported timber grillage supported the scaffolding. GSW&K had beefed up the foundation slab with an additional 15 tons of reinforcing so that it could take the weight of the shells. Solid support at the base of the scaffolding was necessary to prevent differential settlement and cracking of the shells.

Safway Scaffolding Co. of Long Island City furnished and erected the pipe shoring that made up the falsework system. They erected the scaffolding frames on a precise grid system that was sym-

metrical about the ridge line of each shell.

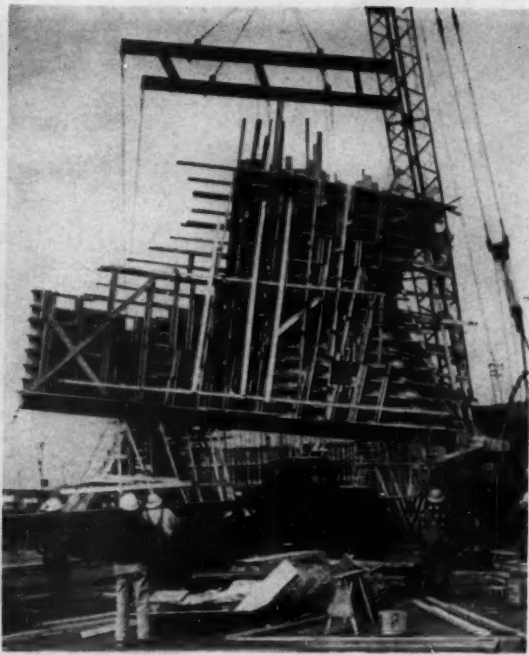
Altogether, the job required 5,500 heavy-duty and standard scaffolding frames. The standard frames carried a maximum design load of 6,700 lb. Maximum safe load on a heavy-duty frame was 10,000 lb.

Forming is designed to simplify construction by providing only the minimum number of supports needed for the shell forms. Each frame was positioned so that it could be as fully loaded as possible. Because of the varying thickness of the shell, spacing of the frames varied from 1 to 6 ft.

When scaffold erection was far enough advanced, a GSW&K crew began assembling the form components on top of the supports. Altogether, the falsework system provided about 1,800 supports. The form components were a U-clamp at the top of each support (see drawing), stringers held in place atop the U-clamps by wedges, and ribs spanning between stringers to hold the timber sheathing.

Key Points Control Layout

First, the crew set the U-clamps at the top of each support, which was positioned at a predetermined elevation by adjusting the jacks in the legs of the top scaffold frames. About every fourth support served as one of the 400 key



MOVING FORMS—Crane loads buttress form section on flatbed truck for trip to building site where it will be set in place for pour.

points controlling layout of the forms.

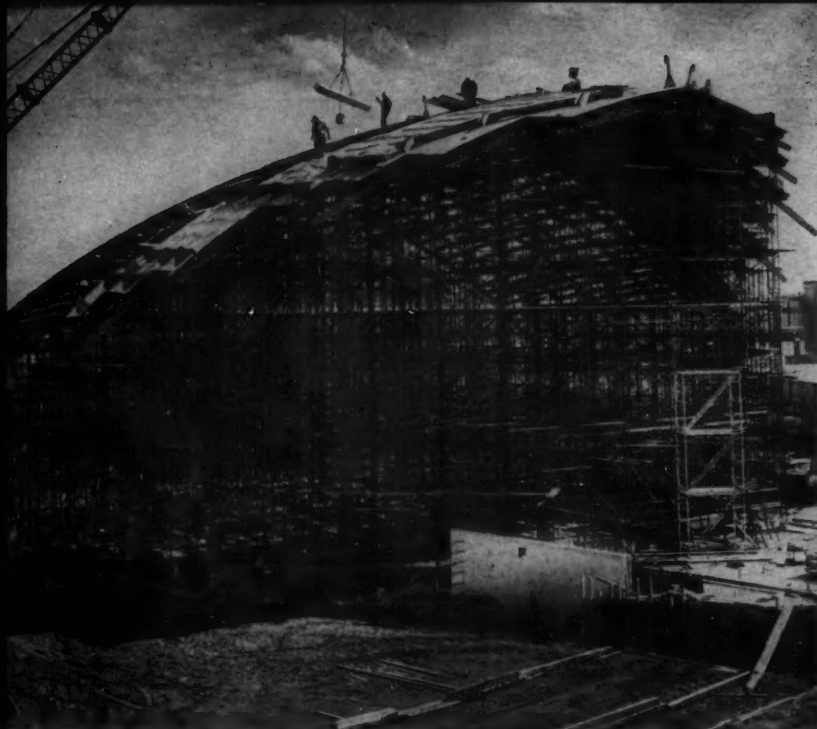
Wood Wedges Secure Stringers

Workmen then installed two wood wedges at each U-clamp. All 2,700 wedges were precut to exact shape in the shop and boxed in lots of 30 for use as work progressed. There were 26 different shapes of wedges. Each wedge was marked with a code number for quick identification and accurate placement.

Next, a crew placed the 3x12-in. stringers atop the wedges in the U-clamps. Ordinarily, the stringers spanned four U-clamp supports; end supports were usually key control points. Each stringer was precut to one of nine different patterns to span continuously between supports with full bearing at each support. Maximum length of stringers was 18 ft. On very steep portions of the shells where slope was 30 deg or more, steel straps were added to secure the stringer-wedge connections.

Atop the stringers in the other direction (parallel to ridge lines), another gang placed 3x12-in. curved ribs at about 3-ft centers. Ordinary 1 1/4-in. wood sheathing nailed atop the ribs completed the shell forming.

Forming started at the extreme outer parts of each shell and pro-



ERECTING FORMS—Crews erect shell forms atop falsework made of 5,500 scaffolding frames. Because shell thickness changes, the scaffold frame spacing varies from 1 to 6 ft.

gressed evenly towards the center. Form erection was so accurate that when shell forms finally met at the center, there was an error of only 1/16 in.

The shells had to be formed as one unit because they are not independent structurally. It took the contractor the best part of a year to complete all formwork. Steelworkers then placed a total of 1,100,000 lb of reinforcing to complete preparations for pouring concrete.

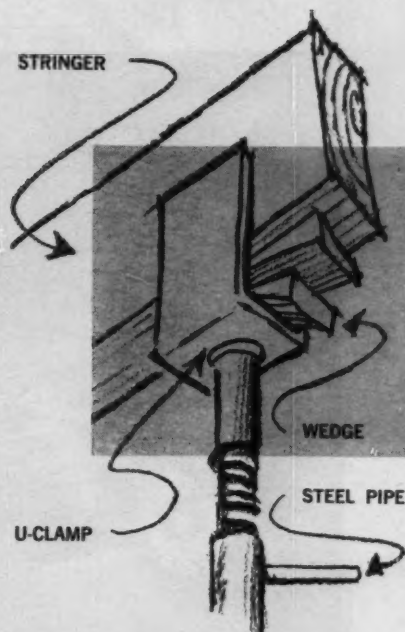
Pouring Plan Revised

The original pouring plan called for placing concrete in three concentric rings circling the entire structure, but the architect disapproved of this scheme. Instead, GSW&K decided to pour the four shells separately, each in a continuous pour.

Two cranes, one at each side of a shell, handled placement of concrete with a third crane in reserve. Each of the three 45-ton Link Belt truck cranes carried a 180-ft boom and a 30 ft jib. They handled two 1-yd concrete buckets; while one was being emptied the other was on the ground being filled. Transit Mix Concrete Corp. supplied the concrete.

Trucks backed up onto timber ramps to raise their chutes above the lip of the concrete bucket at the two unloading stations.

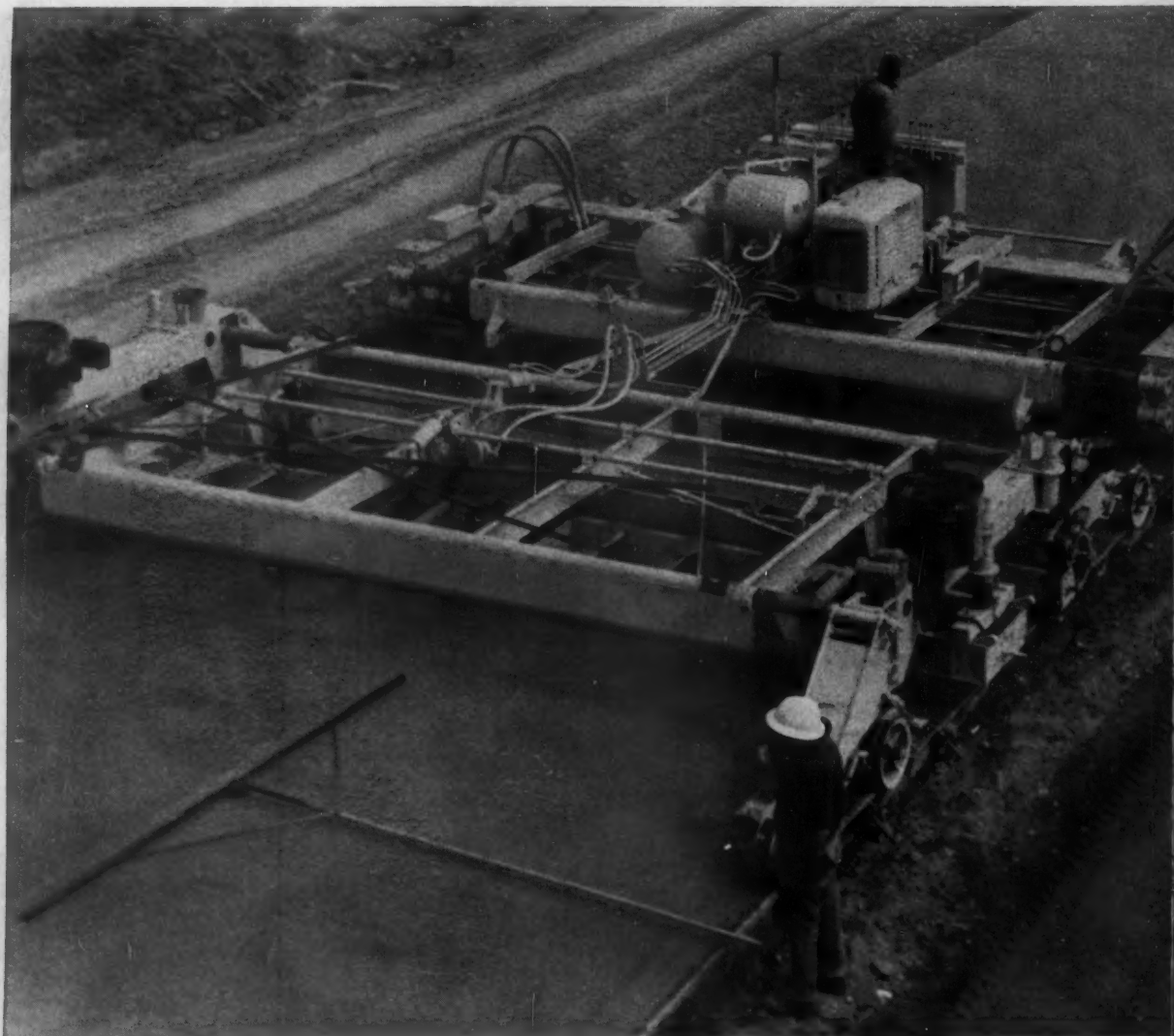
continued on page 148



KEY TO SCHEME—U-clamp atop scaffold leg holds 3x12-in. stringer secured by two specially shaped wedges. Curved ribs at 3-ft centers atop stringers hold sheathing.



POURING CONCRETE—Crane at each side of shell handles 1-yd bucket that pours shell concrete. Counterform panels held in place by wedges hold concrete on steep slopes.



You can lay pavement you are proud of, with a cost-saving smaller crew

Many road builders still don't realize how completely they can mechanize the work behind their pavers.

With a Jaeger paving train, big crews are not only uneconomic — they are unnecessary. *The machines do the job.* Spreading, 4-screed finishing and floating can be done by two operators, or three on high production 2-course work. Width changes are accomplished by hydraulic self-widening. Pitched slab and superelevations are paved with diagonally adjustable screeds that

can lay and finish material *up-hill*.

Forward progress never stops. And when you're through, you have pavement you can be proud of — dense, even textured slab, precision-smooth surface — ready for final edging and the burlap float.

HYDRAULIC-SMOOTH

Jaeger hydraulic power, giving easy finger-touch control of all spreading and finishing functions, means fast, smooth and more accurate operation. It's easy to keep up with today's new-

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JAEGER HYDRAULIC



POWER AND CAPACITY, UNDER FINGER CONTROL: This northwest Air Force base runway slab is 27' wide, 15" thick. Specifications required a full screed at all times. The Jaeger all-hydraulic Finisher has the smooth flow of power, ample traction and finishing capacity needed for any work.



TOWS MESH BRIDGE AS IT SPREADS: This Jaeger 20'-26' Screw Spreader, working on 9 miles of Interstate 94, by-passing Fargo, N.D., hauls with it enough reinforcement for each half-day's run. Hydraulic power gives operator finger-control of big dual reversing spreading screws.

↑ LOOK WHAT ONE MAN CAN DO

Jaeger Finisher, with two screeds, pulls Jaeger Finisher-Float with oscillating screed and 30" wide float pan. One man easily operates both machines with all-hydraulic controls.

4-to-1 CORRECTION

Note that the Finisher-Float carries its screed and float pan suspended between long side trucks on bogey axles. This provides a 4-to-1 ratio of correction independent of any irregularities in the adjacent side forms. This final "kiss" finish leaves a machine-perfect surface, ready for edging, burlap drag and curing spray. With Jaeger equipment, the machines do the job.



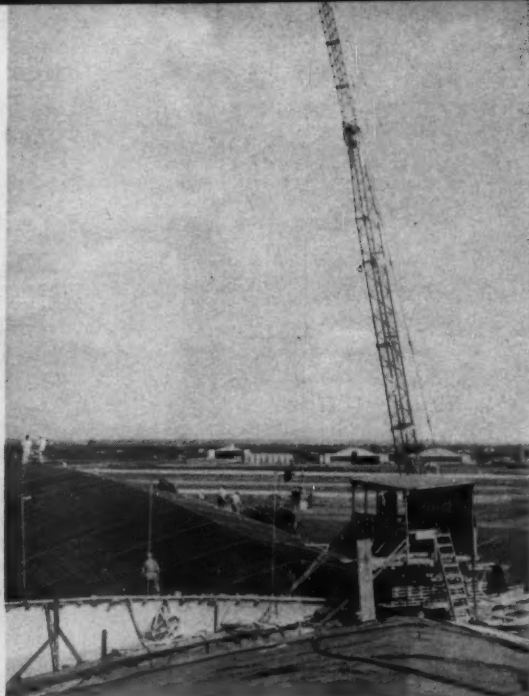
ONE-MAN MACHINE DID IT ALL: This Jaeger 12'-18' combination Spreader-Finisher, starting run on Chicago's Congress Street Expressway, is here set at 12'. It carries 18' diagonal screed with adjustable end shoes. By hydraulic self-widening, machine adjusted itself to 6' flare of the slab without stopping. This one machine did the whole spreading and finishing job, behind a 34E dual drum paver pouring at capacity.

PAVING EQUIPMENT

Radio Controls Balance Concreting



CONTROL POSTS—Radio links control post atop roof with two stations where transit-mix trucks load concrete buckets. Crews bal-



ance concrete on each side of shell. Engineers beneath roof check scaffolding and adjust supports as advancing concrete causes uplift.

ACRE OF FORMS . . . continued from page 145

Each of the two concrete crews brought concrete up evenly on either side of a shell, starting at the buttresses (which had been poured previously) and working out gradually in each direction. Three shifts of workmen spelled each other, working 6 hr and then knocking off for 3 hr. To identify trades, each workman wore a colored armband.

GSW&K set up a timber platform as a control station at the crown of the umbrella and linked it with the two unloading stations by portable radio. An engineer at each station kept a record of the progress of each pour to make sure that one crew didn't get too far ahead of the other.

Meanwhile, other engineers (also in touch with the control station by radio) checked scaffolding and forms from underneath the umbrella. GSW&K had expected some uplift at the top of the shells because of arch action, and had braced the scaffolding to prevent it as much as possible.

Jacks Overcome Uplift

Observers noticed that the upper frames of scaffolding near the top of each shell were separating as each pour progressed. They waited until uplift had reached about 1½ in. and then ran up scaffold jacks until the upper part of the shell was solidly support-

ed again. If this precaution had not been taken, the weight of the advancing concrete would have pushed down the upper portion of shell forms, causing cracks in the concrete below this area.

Masons struck off the concrete with wood screeds that rode on screed bars set atop chairs on the sheathing. The screed bars consisted of ⅝-in. pipe set at about 4-ft centers. They were painted yellow for good visibility at night.

Counterforms Hold Concrete

In all shell areas where slope was 30 deg or more, the concrete crew placed counterforms to hold the freshly-placed concrete. This applied to about one-third the area of the roof. But instead of fabricating 15,000 sq ft of counterforms, GSW&K needed only about 1,500 sq ft of panels. They devised a system of three wedges that would hold each 2x8-ft panel in place and yet make it easily removable. Thus, they could use each panel over and over again. Each panel was made up of ¾-in. plywood braced by 2x4-in. cross-pieces that overlapped adjacent panels.

The concrete mix called for a lightweight expanded shale aggregate. Called Norlite, the concrete weighed about 115 lb per cu ft. Additives included Darex for air-entraining and a pozzolith

manufactured by Master Builder to retard concrete setting and to prevent formation of shrinkage cracks. Specs called for 4,000-psi concrete but actual strength obtained in most tests was closer to 5,000 psi.

The four shells making up the umbrella took about 3,200 yd of concrete. To place the 930 yd in each of the two largest shells, crews worked 27 hr around the clock.

About 15 days after the last shell pour, a crew began decentering the forms. They lowered the pipe shoring supports a little at a time in a carefully planned sequence by means of adjustable jacks at the top of each scaffold leg. Deflection of the umbrella after completion of decentering was only about half what engineers had expected.

Men on the Job

Construction superintendent for GSW&K is Kenneth Morris. The project engineer who designed the forms is Vladimir Petrovitch; his assistant is Susan Tausanovitch. Field engineer is Tony Coyle. Superintendent in charge of concreting is Frank Cossolino.

Representing the architect, Eero Saarinen, at the site is architectural supervisor Ralph Yeakel. Consulting engineers are Ammann & Whitney of New York.

TROJAN SAFETY CURVE LIFT ARMS

**BUILT
AS ARMS
SHOULD
BE...**



**Only Trojan's
box-type construction gives
greater strength & capacity.**

Many times stronger than single plate construction, Trojan's box-type design produces higher resistance to torsional loads and, with the tubular cross member, minimizes normal working stresses — results in more even load distribution. All fittings and couplings are exposed and easily accessible for faster maintenance. The safety curve box design with internal linkage assures greater operator protection — yet allows full visibility for fast, continuous production . . . Let the many advantages of Trojan's high performance design cut your operating and maintenance costs. Ask your local distributor for a feature by feature inspection.

TROJAN®
TRACTOR SHOVELS
YALE & TOWNE

THE YALE & TOWNE MANUFACTURING COMPANY
TROJAN DIVISION
BATAVIA • NEW YORK

SEVEN MODELS TO CHOOSE FROM, 7,000 LBS. TO 24,000 LBS. CAPACITY

Circle 149 on Reader Service Card





SEEN IN ALL THE WORST PLACES

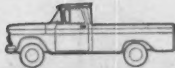




They keep showing up in places most trucks can't get to because it takes an awful lot to stop these sure-footed Chevy four-wheel-drive models! Where the job calls for the mobility of a mountain goat teamed with the stamina of a mule, you'll find no finer way to get your work done. And for 1961 the Chevrolet 4-wheel drive lineup is a full dozen models long. You can pick from a wide selection — one that's sure to include the best answer to your toughest traction-plus requirement!

■ Put any one of these 4-wheel drive Chevis on any job—then watch it dig in and go! Come what may in the way of mud, snow, sand, loose gravel, creek bottoms, swampland or freshly plowed ground, you can rest assured that the extra bite of up to double traction—plus stump-jumping road clearance—will get you through every time.

And you'll like the way a Chevy 4x4 rolls down the highway in smooth 2-wheel drive, ready to give you 4-wheel traction at the flick of a lever, the moment you need it. You'll appreciate the no-clutch

shifting ease of the transfer case (whether moving or standing still) and the extra versatility that's yours with a choice of 4-wheel direct or underdrive.

If you prefer the extra snap of spirited V8 power, it's yours at nominal extra cost in any model. Also available at extra cost are heavy-duty 3-speed and 4-speed transmissions and a wide choice of traction tires. You can tailor your Chevy 4 x 4 to fit your needs exactly. Get the full details and turn your traction problems over to Chevy—the traction champ of them all!... Chevrolet Division of General Motors, Detroit 2, Michigan.

FLEETSIDE			STEPSIDE			CHASSIS-CAB			PANEL			CARRYALL		
														
Model	Max. Load	Body Length	Model	Max. Load	Body Length	Model	Max. Load	Wheel-base	Model	Max. Load	Body Type	Model	Max. Load	Body Type
K1434	1400 lb.	6½'	K1404	1450 lb.	6½'	K1403	1900 lb.	115"	K1405	1300 lb.	7½' Panel	K1406	1000 lb.	Carryall (panel type rear doors)
K1534	1300 lb.	8'	K1504	1350 lb.	8'	K1503	1850 lb.	127"	K1406	1000 lb.	Carryall (panel type rear doors)	K1416	1000 lb.	Carryall (tailgate and liftgate)
K2534	2950 lb.	8'	K2504	3050 lb.	8'	K2503	3500 lb.	127"						

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PLEASE SEND COMPLETE INFORMATION ON THE CHEVROLET 4-WHEEL DRIVE LINEUP TO:

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Fill out and mail coupon to:
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 Chevrolet Motor Division
 General Motors Corporation
 Detroit 2, Michigan

23

1961 CHEVROLET STURDI-BILT TRUCKS



Circle 151 on Reader Service Card



The most comprehensive display of plant, machinery and equipment ever assembled in one place for the world's building and civil engineering industries will be arranged on a magnificent 32-acre open-air site . . . with extensive proving grounds for equipment of every kind to be operated under normal working conditions.

The Construction Equipment Exhibition provides a unique opportunity for buyers, contractors, builders, engineers and surveyors to inspect the finest range of plant and equipment the world has to offer . . . and to investigate at first hand the latest techniques and newest equipment.

INTERNATIONAL CONSTRUCTION EQUIPMENT EXHIBITION

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Construction Equipment

The Federation of Civil Engineering
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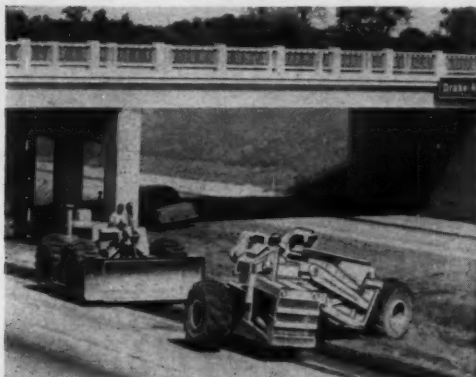
Circle 152 on Reader Service Card

What tools would YOU use to dig a trench 4' wide...6" deep... and 50 miles long?

Holloway Construction Co. of Livonia, Michigan, was given that "odd" job recently widening U.S. 16 and improving shoulders near Farmington. Holloway's choice: two LeTourneau-Westinghouse D Tournapulls® and an LW Tournatractor®. The choice proved to be a wise one.

Paver-ready cut in one pass

Fitted with special blades limiting cuts to the specified 6" depth and 4' width, the "D's" showed enough muscle and loadability to do the job on a one-pass basis. In addition, flat scraper bottoms (rather than rounded), produced a cut so smooth and accurate it was "paver-ready."



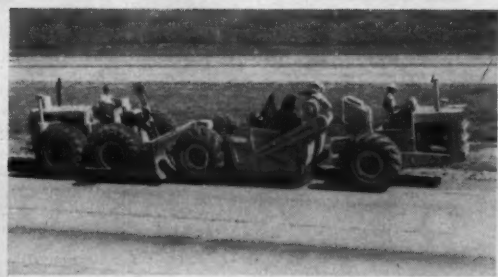
With traffic on the highway at all times, D 'Pull* maneuverability proved handy. With 24'3" turn-radius, the industry's shortest, the "D's" moved in and out of traffic-and-trench quickly. And, because they're light enough, narrow enough, and fast enough, the Tournapulls were able to make their return trips on the highway pavement itself!

Pushing with two tires on the slab

Tournatractor is usually more pusher than you need for 9-yd "D's", but on this job it helped set the high-speed pace... first packing heaped loads into the scrapers fast, then boosting the "D's" out of the cut in high gear. And because it rolls on rubber, not metal, Tournatractor was able to do its work with one side up on the pavement itself, for the "edge-of-slab" cutting required.

For odd jobs or straight production dirtmoving, LW Tournapulls and Tournatractors can help you move dirt at lowest-cost-per-yard. Ask us for details on this complete line of fast-moving equipment.

*Trademark DP-2358-DCJ-1



LETourneau-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Circle 153 on Reader Service Card



Heading for the fill, Fredrickson and Watson's B Tandems accelerate fast... haul at speeds of 23 mph... return to cut at 25 mph! The 430-hp V-Power B "Pull" has an easy-shifting, high-low range transmission.



Tandems...

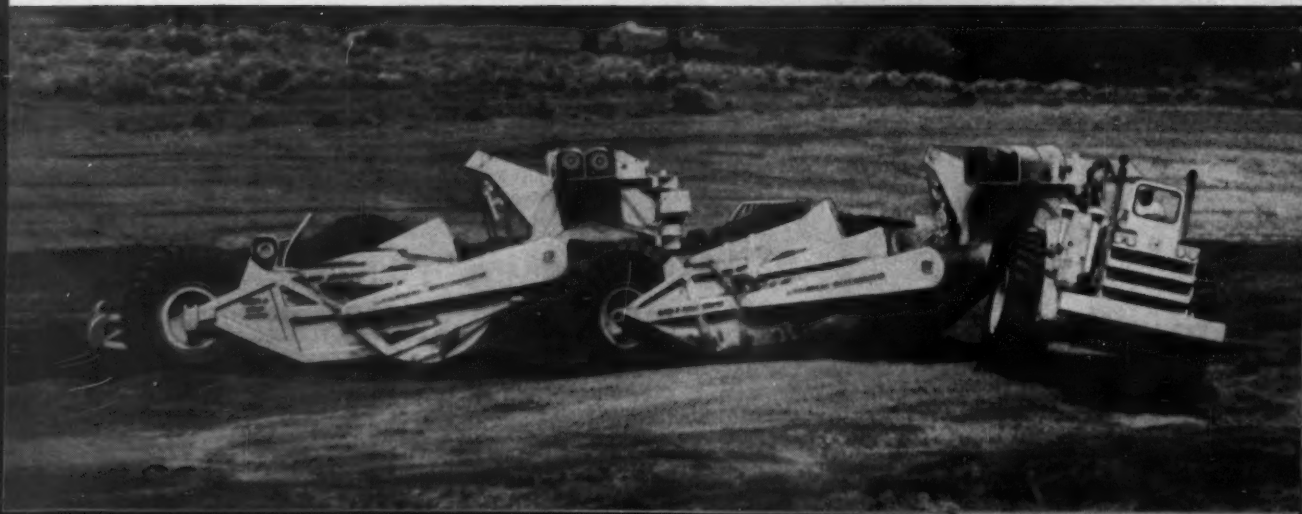
sensational on

short hauls...



now "living up to highest expectations" on long hauls!

With positive electric steer and LW universal swivel-hitch, operator performs every standard maneuver, including full U-turns and back-ups. Simple connection between scrapers makes it easy to add or take off the extra LW scraper as conditions demand.





You've read about outstanding performance of LeTourneau-Westinghouse Tandems on short hauls. Now, Fredrickson and Watson Construction Co., Oakland, California, reports LW Tandems are setting new production records on hauls up to 7,000 feet!

The firm is using two V-Power B Tournapulls® each pulling two 29-yd Fullpak® scrapers on 11.9-mile highway job near Susanville, California. The "B's" loaded both scrapers to 23-yd struck capacity in an average of 1.6 minutes! This load time is even more impressive when you consider that the units often had to be loaded up-hill and were pushed by a single 200-hp tractor.

Haul 264 scraper loads in 10-hour day

According to accurate job records, Superintendent Bob Brodie reports the two B Tandems completed 132 trips in a 10-hour day on cycles of 5,000 ft. *That's 264 scraper loads, or over 6,000 pay-yards!*

After watching these electric-control LW machines perform, Robert F. Calou, Vice President of Fredrickson

and Watson Construction Co., says, "These tandems are doing a very fine job. They're holding up beautifully... *are living up to highest expectations!*"

Big savings in time, money

Fredrickson and Watson realize considerable savings in time and costs with B Tandems. The firm points out that only one operator is needed to get double capacity... there's only one engine instead of two with resulting economies in operation and maintenance... only six wheels instead of eight... and only one push tractor is needed, rather than 2 that might be needed to load a "super-sized" single scraper of the same total capacity.

Let us give you complete details and show you full-color motion pictures of LW Tandems at work on jobs similar to yours. *See for yourself* how this revolutionary development offers you a practical way to double capacity on every trip! Remember, too, we can convert your present 'Pulls for tandem operation.

*Trademark BTP-2346-DCJ-2

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

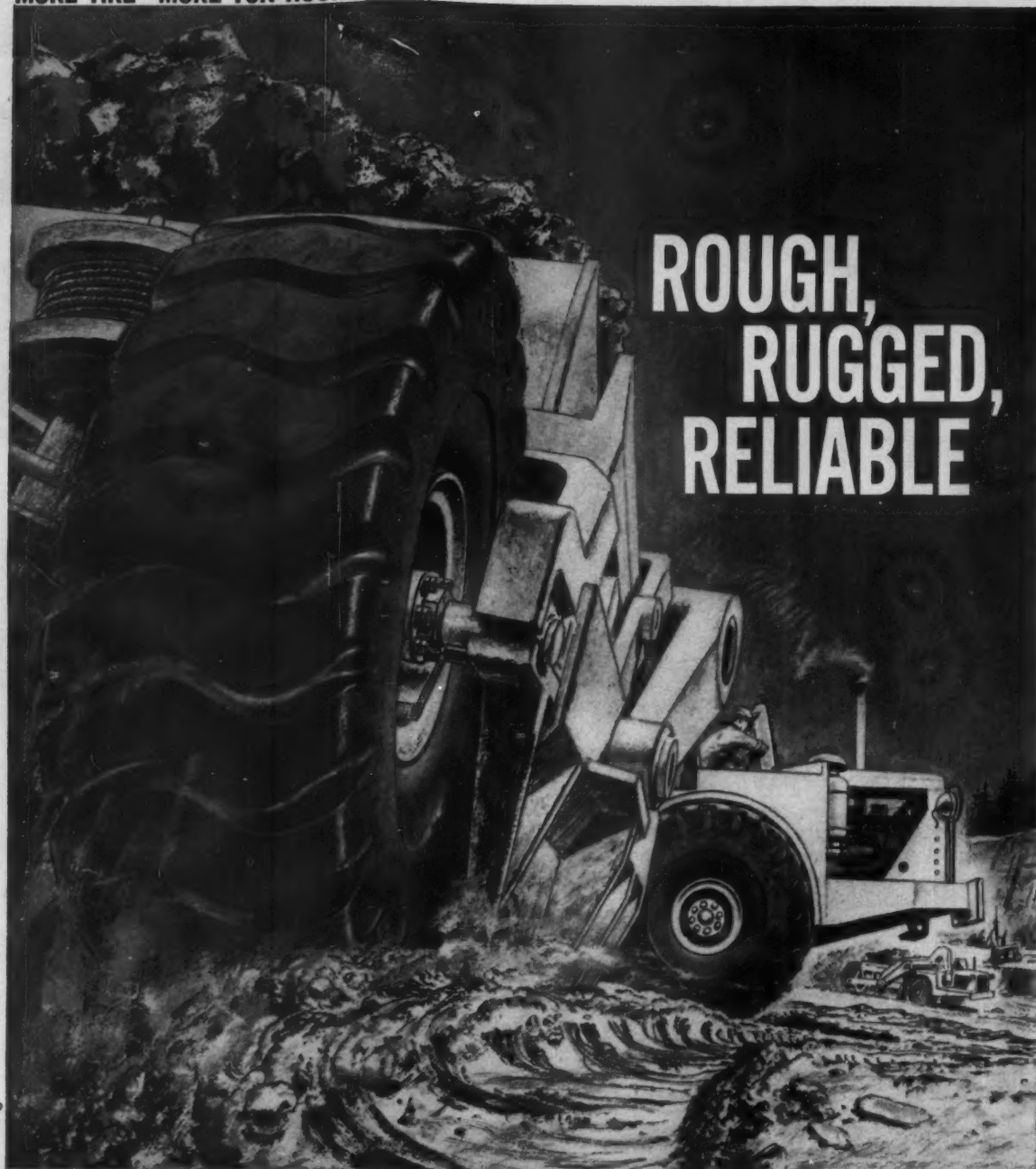
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



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MORE TIRE—MORE TON HOURS



**ROUGH,
RUGGED,
RELIABLE**

U.S. ROYAL CON-TRAK-TOR—FULL LUG Built burlier to take it under the roughest conditions • Increased resistance to impact and rock penetration • Wide, full-lug tread gives more ground-gripping contact and flotation—resists side slippage and assures more ton hours of service • More durable carcass—more tires retreadable • Prove-test them on your present equipment, specify them for your new machines • Call your U.S. ROYAL DEALER today for sure.

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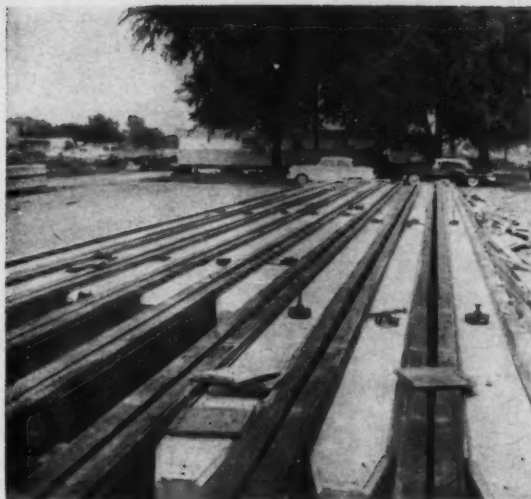


TRUCK TIRES



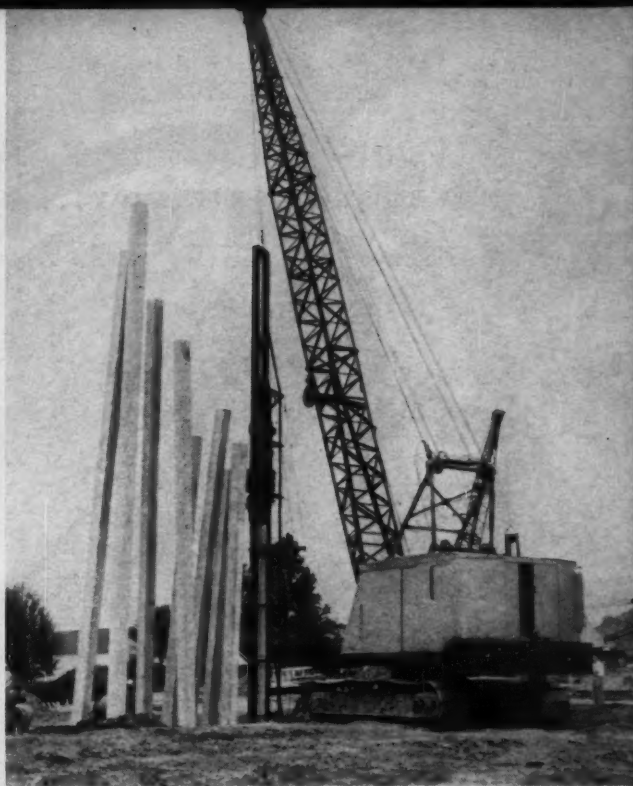
**UNITED
STATES
RUBBER**
Rockefeller Center, New York

Circle 156 on Reader Service Card



PARALLEL FORMS—Eight piles are cast side by side on a 19-ft-wide bed. Swiveled, removable lifting hooks are cast into each pile.

DRIVING THE PILES—Lorain crane with a No. 1 Vulcan hammer drives the piles in pre-bored holes. Piles to left have just been placed in holes. Some are battered, some straight.



Simple Beds Cast 20 Piles A Day

With a minimum of plant and equipment, a Nashville contractor achieves a high production rate for precast concrete piles. Piles are needed for a Little Rock road project.

YOU DON'T NEED an expensive plant to achieve high production of precast concrete piles. Proof of this is a road job in North Little Rock, Ark., where the contractor turned out 20 precast piles a day with a simple, home-made plant and a minimum of equipment.

Foster & Creighton Co., of Nashville, has a \$3.8-million contract to build 8,000 ft of the Little Rock-North Little Rock Expressway. The foundations for a number of bridges and overpasses on the job required the contractor to make and drive 1,900 14-in.-square concrete piles ranging in length from 40 to 70 ft.

Foster & Creighton set up two large casting beds, 300 and 315 ft long respectively, and each about 19 ft wide. The beds consisted of a 4-in.-thick concrete pad laid on a compacted earth base.

Eight parallel pile forms were positioned across the width of

each bed. The number of forms that could be placed lengthwise along the beds depended on the length of piles required at any given time.

Under the forms, spanning the width of each bed at 3-ft centers, were strips of 2x4-in. lumber. The forms were fastened to these cross strips.

Each form consisted of a $\frac{3}{4}$ -in. plywood bottom and $\frac{3}{4}$ -in. plywood sides. Under the bottom panel were two 2x6-in. support planks running the length of the form.

To brace the side panels, 2x4-in. plates were nailed along top and bottom of the outside of the panels. Vertical 2x4-in. studs provided additional stiffening.

One side of each form was hinged so that it could swing back to release the completed pile. The connection—3-in. strap hinges on 6-ft centers—was between the

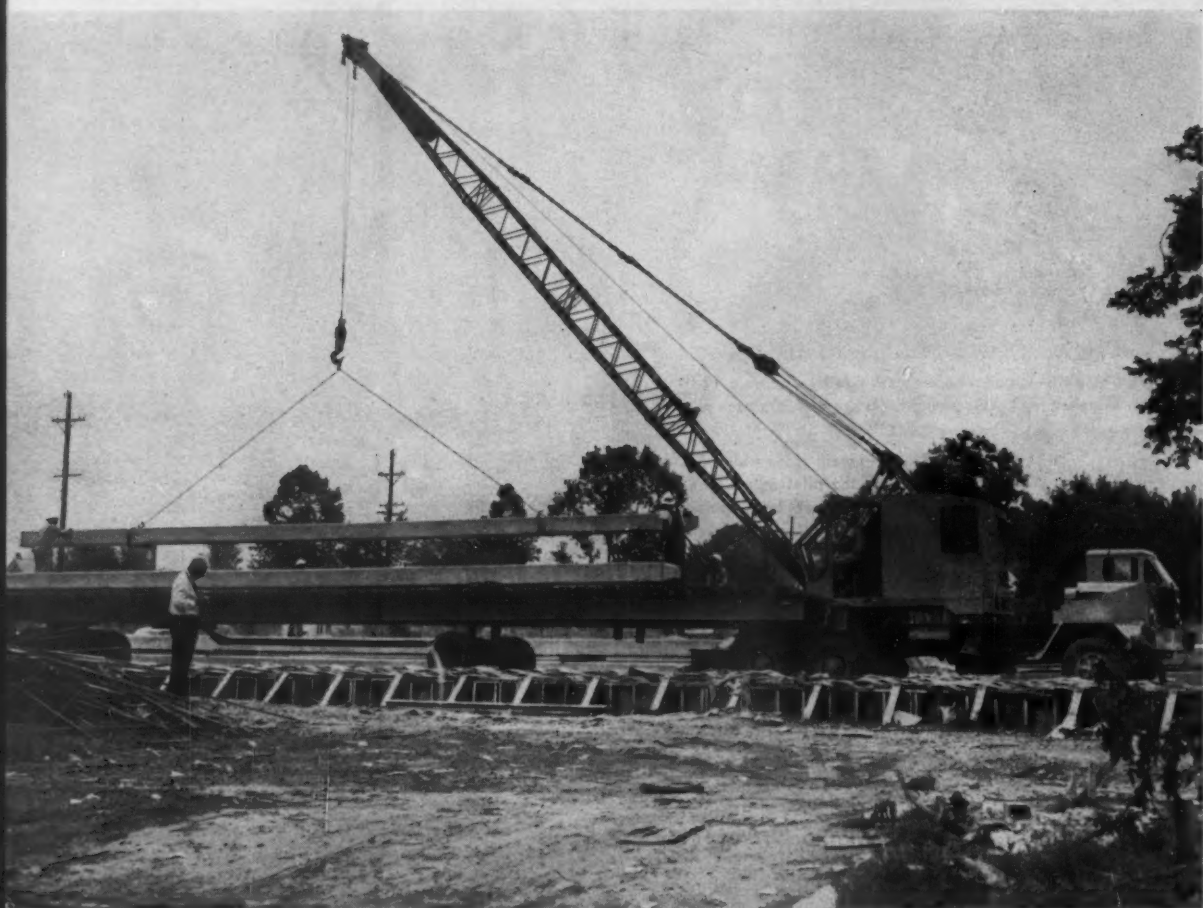


TIP FORMS—Steel forms shape the pointed driving tips. Other ends are flat across.



MANPOWER—Sixteen men replace crane as they lift reinforcing cage into position.

SIMPLE BEDS CAST 20 PILES A DAY . . . continued



REMOVING THE PILES—First heavy equipment used in process has the job of removing the piles from forms. Piles are hauled to

driving site on contractor-built trailer. The trailer consists of a pair of WF girders mounted on a single-axle, dual-wheel dolly.

bottom 2x4 side piece and the wood cross pieces under the forms.

To form chamfered edges on the piles, 1-in. beveled wood strips were nailed to the side forms at the four corners of the pile. Across the top of the forms were 2x4-in. ties on 4-ft centers. These pieces held the forms together during the pour.

Bulkheads shaped the ends of each pile. One end was flat. The bottom end bulkhead was a tapered metal form that shaped a pointed driving tip on the pile. Two swiveled removable lifting hooks were cast into each pile.

Foster & Creighton had an American truck crane at the beds to load the completed piles onto a truck. But for one chore, which

normally would be considered a crane job, they found that manpower was faster. That was the job of lifting the reinforcing cage into the form prior to the pour. Whenever this had to be done, all the workmen on the spot got together to pick up the cage and carry it to the form. It was an easy lift for 16 men.

Curing was a low-cost but efficient operation. Crews placed burlap over the piles. Then they laid down perforated hose that directed the water spray evenly over the bed.

Driving the Piles

Foster & Creighton drove the piles with a No. 1 Vulcan hammer mounted on a Lorain 80 crane.

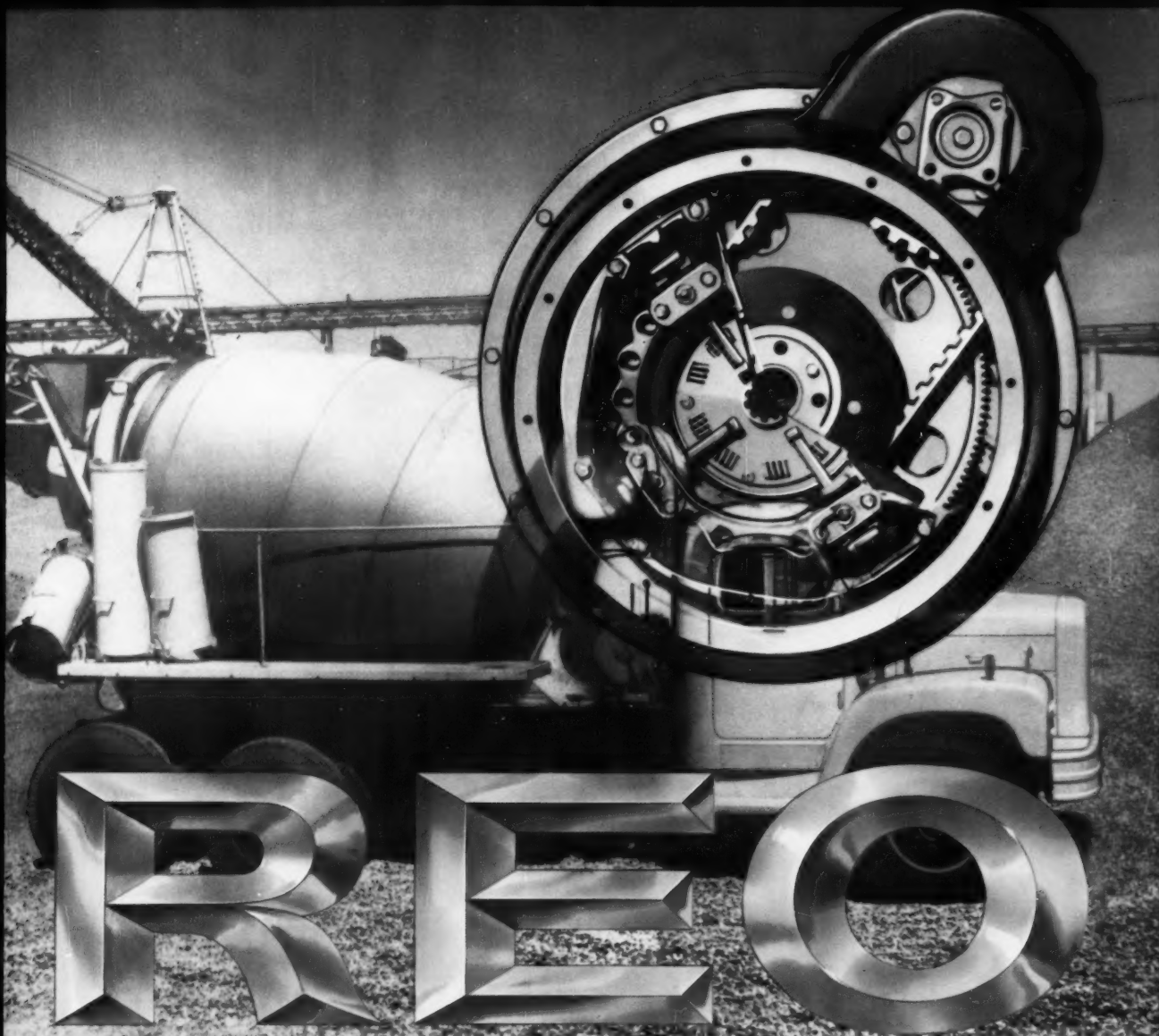
The rig had swing leads that were positioned during driving by chains anchored to a No. 4 Cat loader. A 2-in. oak cushion block protected the top of the pile.

Auger Pre-Bores Holes

A 900-cfm Gardner-Denver compressor supplied air through a 3x7-ft receiver to the pile hammer and to a crane-mounted earth auger that pre-bored holes for the piles.

Average driving production was 800 ft of piles per 10-hr day. Maximum rate was 1,600 ft per day.

Leonard Young was superintendent for Foster & Creighton. John Burnett was pile superintendent.



**PAYLOAD
PROVEN...
FLYWHEEL
POWER
TAKE-
OFF**



- **MARTIN BLOCK CORPORATION** "Most satisfactory even under extra heavy loads and tough operating conditions. We carry payloads more economically and we do not have the expense of a separate mixer engine." *Ray Chambers, Sr., Supervisor of Fleet Maintenance.*
- **READY MIX CONCRETE COMPANY** "We are more than pleased with our Reos equipped with Flywheel Power Take-Off. We save an additional 450 pounds in weight over our conventional equipment." *Lawrence Ross, Superintendent.*
- **MARSHALL SAND & GRAVEL COMPANY** "Very good results on our two Reo C-432s with Flywheel P-T-O. No maintenance costs so far after nine months of operation. Our Reos save us 1000 pounds in weight over our former equipment." *Robert Marshall, Partner.*
- **CONCRETE HAULAGE, INC.** "In 11 months of service . . . no maintenance cost on Flywheel Power Take-Off of our three Reo C-442 models. The P-T-O is a very satisfactory way of operating transit mixers." *R. C. Martin, Manager.*

Gold Standard of Values



REO MOTOR TRUCK DIVISION • THE WHITE MOTOR CO. • LANSING 20, MICH.

Scaffolding and Shoring Methods...

by PSS



Safe, sure support for complicated roof . . .

20K frames (each capable of carrying 10,000 lbs. per leg) of "Trouble Saver"® Sectional Steel Shoring are used here to support this complicated 1'-to 5'-thick concrete roof system of sloping planes and hyperbolic paraboloids. Shoring is quickly erected in free standing, safe towers to meet varying heights. 5-bay, 52' x 167'. St. Mark's Episcopal Church, New Caanan, Conn., is being constructed by Frank Mercedes & Son, general contractor.

PSS

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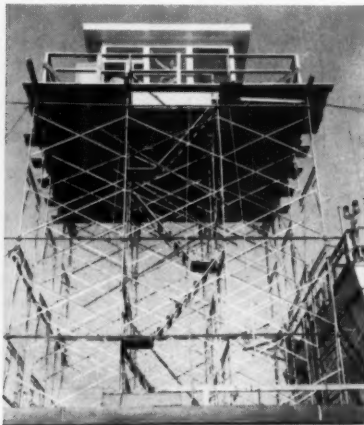
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160



Double decker . . .

Upper level is standard 5'-wide "Gold Medal"® Safety Scaffold Machines used for installing face brick. Lower level is special 5'-wide platform hung 6'6" below by steel cable from upper scaffold, used for installing shadow wall. Y.M.C.A. building, New Orleans, Gervais F. Favrot, contractor.



Temporary tower . . .

26'-high "Trouble Saver" Scaffolding tower with interior steel stairways is erected atop the 126'-high Terminal Building, Logan Airport, Boston, for use by Federal Aviation Agency. 6'6" end frames are tied together with standard diagonal braces and extra "TubeLox"® tubular members. Entire unit is guyed to inserts welded in steel. Note interior "Trouble Saver" Scaffolding stairways for access.

CONSTRUCTION METHODS

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distribution, sales personnel and other activities.

Distributor Appointments

Highway Equipment Co.: A.B.S. Contractors Supply Co., Cincinnati, is distributor for sections of Ohio and Kentucky.

Allis-Chalmers Mfg. Co.: The Martin-Roosa Tractor & Equipment Co., Cedar Rapids, has been appointed a distributor for A-C motors and pumps in 18 Iowa counties.

Huber-Warco Co.: Mack Truck Sales of Wichita has been named distributor for the Huber Warco line, in a 16-county area in south-central Kansas.

Koehring Co.: The Buffalo-Springfield Div. has named Contractors Machinery Co. of Grand Rapids a distributor for Michigan. The Kwik-Mix Div. has appointed Chesapeake Supply & Equipment Co. of Baltimore a distributor for Maryland, the District of Columbia, and parts of Virginia and Delaware.

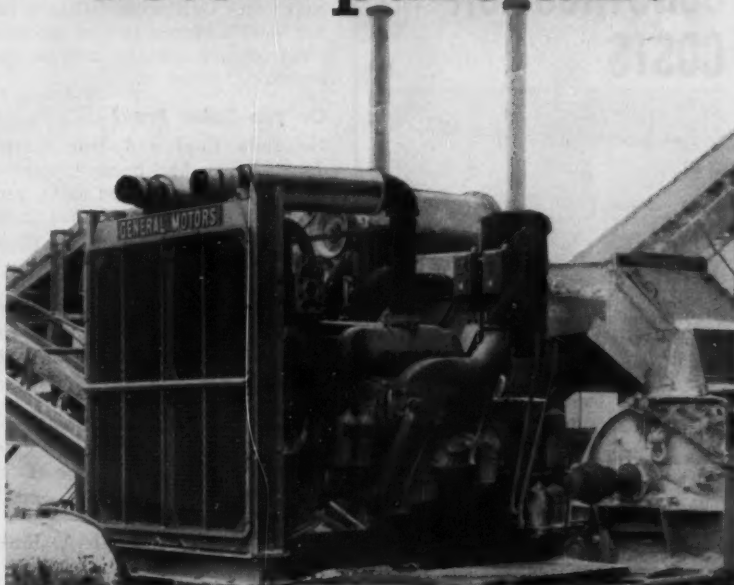
Buck Equipment Corp.: Sinclair Sales Co. of Houston has been named southwest regional representative for Oklahoma, Texas, Arkansas, Louisiana, Mississippi, and western Tennessee.

Mearl Chemical Corp.: J. B. Eurell Co. of Lansdowne, Pa., has been named a franchised erector of Mearlcrete foam concrete for New Jersey and parts of Pennsylvania, Connecticut, and New York.

FWD Corp.: Fehrs Concrete Equipment Co. of Omaha has been appointed dealer for ready-mix trucks in South Dakota and parts of Nebraska and Iowa.

Boulton Tubular Structures, Ltd. of England: Superior Scaffold Co. of Culver City, Calif., has been appointed national distributor for Boulton's entire line of scaffold clamps. *continued on next page*

Crusher dust gets so thick you can't breathe... but Donaclones deliver 99.9% pure air!



Dust gets so thick around this ag limestone plant, it often hides the equipment. Diesel engines on crusher and hammermill used to require frequent overhaul with expensive downtime.

After Donaclones were installed, engines were operated according to the previous overhaul schedule and then examined. They showed practically no signs of wear.

The Donaclone's primary centrifugal cleaner removes 98% of the dust. Only 2% remains for the Duralife paper filter giving it an extra-long service life. And it can be renewed when necessary, by dunking in water and detergent.

Add years of engine life by modernizing with Donaclones.

Write for name of dealer



Side inlet model



Center tube model

Donaclone by Donaldson

666 Pelham Boulevard • St. Paul 14, Minnesota

Circle 161 on Reader Service Card

HOW "CONCRETOR" The Linden Crane CLIMBING-CRANES REVERSE RISING CONSTRUCTION COSTS



Peter Kiewit Sons utilizes "CONCRETOR" CLIMBING-CRANE in effecting important savings of time, labor, money on own office building in Omaha, Nebraska.

The "CONCRETOR" CLIMBING-CRANE goes up with the building while work is in progress... 2-3 floors at a time... the sky's the limit. Climbs by its own hoisting winch on floors or inside elevator shafts.

"CONCRETOR" CLIMBING-CRANES efficiently place loads "on a dime"... up to 100 foot radius due to the 360 degree swing of its 100 foot jib. They eliminate the need for expensive rehandling of materials over unnecessary ramps and runways, substantially lowering operating costs. Recommended for all types of construction including industrial, apartment and office buildings, silos, water towers, bridges and viaducts.

"CONCRETOR" CLIMBING-CRANES cost about half of what you'd expect to pay for earth-bound cranes of similar capacity. With ordinary use, the cost can be amortized over a period of about 2 years.

CHOICE OF 4
MODELS —
RENTAL/
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Delivered any
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Factory-trained
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630 Sixth Street, San Francisco 3, California

Circle 162 on Reader Service Card



Crane is remote-controlled by one man from working deck with 3½ lb. electronic panel.

SALES AND SERVICE . . . continued

Harnischfeger Corp.: The Harris Euclid firm of Sioux Falls has been named South Dakota dealer for P&H construction and mining equipment.

Metal & Thermit Corp.: Victor Equipment Co. has been named southern California distributor for M&T's Murex line of welding electrodes, machines, and accessories.

On the Sales Front

Colorado Fuel and Iron Corp.: Jack Drigga has been appointed manager of wire rope sales, and Howard M. Dorward has been named product sales engineer in the same department.

U.S. Steel Corp.: George Cooper has been named manager of reinforcing bar sales for U.S. Steel Supply's Cleveland district.

L.B. Foster Co.: Jack McAninch has been appointed sales representative in L. B. Foster's Houston office.

Quick-Way Co.: Philip A. Jenks has been named director of sales of the Quick-Way Truck Shovel Co.

Barnes Mfg. Co.: Robert L. Sears has been appointed manager of Barnes' construction and industrial sales.

Bucyrus-Erie Co.: The International Div. has named Jorge A. Rossi export sales manager.

American Brake Shoe Co.: The Amaco Div. has named George Morrison sales representative in Houston for the entire line of hardsurfacing products. He will cover Texas, New Mexico, Oklahoma, Louisiana, and Arkansas.

Duff-Norton Co.: C. Richard Schmitt has been appointed sales representative in New York State, and John S. Ray, Jr., has been named sales representative for Missouri, Illinois, and Kansas.

Lull Engr. Co.: Herbert C. Lull has been appointed general sales manager.

U.S. Concrete Pipe Co.: H.M. Sealfield has been named general sales manager.

continued on page 164



name's

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products
are
**GRAY and
DUCTILE
IRON
CONSTRUCTION
CASTINGS
of finest
QUALITY
FINISH
UNIFORMITY**



Delivery is prompt; we have huge on-hand stocks of standard items

PLUS

15,000 patterns

PLUS

a daily production capacity of 500 tons in our two plants.



Name's Neenah... if we make it it's a casting... and the best.

New 168-page catalog shows our line. It's sent promptly when requested.

**NEENAH FOUNDRY
COMPANY**

NEENAH • WISCONSIN

Chicago Office

5445 North Nava Ave., Chicago 31, Ill.

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CONSTRUCTION METHODS

An INSLEY gives the best SERVICE

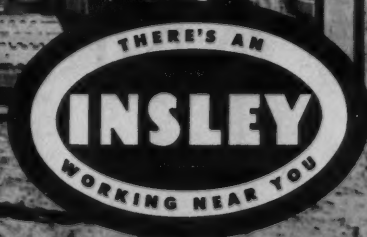
Take this Insley M for example. The modern wide-vision cab lets the operator see his work in all boom positions. Dependable, easy-working controls and clutches let the operator do more with less effort. A third drum provides an additional load line for snaking in pilings, etc. Conservatively rated parts stand up under the toughest conditions with greatly extended service life. These are just a few of the Insley "plus" features. Get the full story from your Insley dealer today.

... gets the best service, too!

The Insley service network includes over 100 dealer locations throughout the U. S. and Canada. Each dealer has trained servicemen and is well stocked with genuine Insley parts . . . ready to handle virtually any service problem on an around-the-clock basis. Consider the importance of service and parts when you buy a new machine, and you'll buy an Insley every time.



INSLEY MANUFACTURING CORPORATION
P. O. Box 167 • Indianapolis 6, Indiana





NICRO MANG*
for manganese
build-up and repair
in place of
stainless steel

NEW X-53
high speed
composite for
all-purpose
hardfacing

TOO MANY RODS?

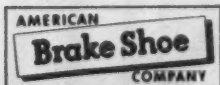
STANDARDIZE ON THE "PAIR FOR WEAR" for hardfacing and manganese welding

There's no need to "buy the catalog" when the "Pair for Wear" can handle 90% of your build-up and hardfacing work. Use the "Pair for Wear" wherever you need high impact and abrasion resistance. *Standardize* on them.

But *test* them first, and see how the "Pair for Wear" get their reputation for handling ease, usability, fast deposit and good-looking bead. See if the "Pair for Wear" doesn't give you *the best results you've ever had*. Write us now for technical bulletin and test samples of rods.

Available in 50 lb. standard manual packages and 50 lb. semi-automatic coils.

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Other plants in: Denver • Los Angeles • New Castle, Delaware • Oakland, California • St. Louis
Welding products distributed in Canada by Canadian Liquid Air Co., Ltd.

◀ Circle 163 on Reader Service Card

Circle 164 on Reader Service Card

164

continued

Clark Equipment Co.: The Construction Equipment Div. has named Stanton D. Needles of Indianola, Iowa, as a district service representative. He will be in charge of service for the Michigan line of machinery in Iowa, Nebraska, South Dakota, and parts of Illinois.

Eimco Corp.: Julius G. Kern, Jr. has been appointed New York district manager for tractor-loader sales.

Allied Chemical Co.: The Barrett Div. has named P.C. Cowart director of sales for paving materials and has appointed John F. Gordon assistant director of sales and Frank P. Collins sales manager for New York.

Simplex Forms System, Inc.: William Van Helden has been named sales representative for Iowa and eastern Nebraska.

Air Reduction: The Air Reduction Sales Div. has appointed J.P. Casalis, Jr. district manager of the St. Louis district.

Engineered Equipment, Inc.: Norm Pullock has been named national sales manager for the Masonry and Concrete Saws and Blade Div.

Thor Power Tool Co.: Kenneth W. Nelson has been appointed a regional sales manager. His territory will extend from the Carolinas through New England.

On the Sales Front

Mack Trucks, Inc.: Albert G. Crockett has been named general sales manager.

Dewalt, Inc.: James W. Anderson has been appointed Minneapolis district sales manager for the Minnesota, North Dakota, and South Dakota territories. L. John Roosa, Jr. has been named Cleveland district sales manager. T. Lamar Hunt is manager for the Atlanta district and will coordinate sales activity in the southeastern territory.

Owatonna Tool Co.: The Tools & Equipment Div. has named Richard Vandermeulen district representative for Iowa, with headquarters in Des Moines.

continued on page 167

CONSTRUCTION METHODS



As rolling resistance decreases, operator of the 61 hp* International 460 can shift up and "throttle back" to maintain work-

ing speed while saving fuel. Your bigger, more costly power can be kept working more profitably on your earthmoving work.

Power-match your jobs with . . .

Cost-cutting drawbar power on rubber

Only International offers such a wide range of wheel tractor power sizes—allowing you to power-match your jobs and thus trim costs. In the heavy-duty class, for example, you can select from three power ratings: 61, 72.5, and 95 hp*, all with Multi-Range six-cylinder engines . . . gasoline, LP gas, or Diesel.

Multi-Range engine design and Torque Amplifier drive give an infinite range of work and travel speeds from less than one mph to 18 mph. You get bulldog lugging power for slow, heavy pulls. Throttle back and shift up for top fuel economy when the load is light.

An IH Dealer near your job will gladly demonstrate an International® 460, 560, or 660 or any others in the International line of eight sizes 13.4 to 95 hp*. For full-line catalog, write International Harvester Co., Dept. CME-4, P. O. Box 7333, Chicago 80, Ill.

**Maximum engine horsepower at standard conditions*



INTERNATIONAL HARVESTER

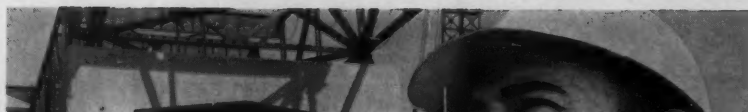


Self-loading in tough clay and shale, a 95 hp* International 660 heaps this 11-yd elevating scraper in 40 seconds. A combination like this slashes investment and operating costs on short-haul or clean-up work.

Compacting subgrade for a four-lane highway in Iowa, a 72.5 hp* International 560 handled this sheepsfoot roller 80 per cent faster than the power formerly used, according to the contractor.



SALES AND SERVICE . . .
continued

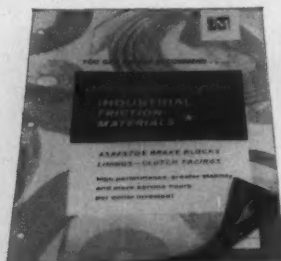




MOLDED J-M Facing Segments being riveted to a swing friction member.

Woven or molded?

WHICH FRICTION MATERIAL DO YOU PICK FOR LOWEST OPERATING COST-PER-HOUR AT MAXIMUM EFFICIENCY?



New J-M Frictions Selection Guide helps you get the answer in seconds!

Selecting friction materials is a complex matter. How do you go about picking the right one? Many styles are available, yet only one will give you safest operation, peak performance and longest service life for a particular application.

With success or failure hinging on correct selection, the new J-M Frictions Selection Guide can be of great service to you. Every figure in it is based on detailed performance studies. All sixteen pages are loaded with specific design data in simplified table form. You will find it accurate, informative and easy to use.

Whether you require a disc, cone,

band, block or lining...for use in wet or dry service, light or heavy duty, slow or high-speed operation, under heavy or light service... this book will give you performance characteristics, available sizes and shapes, dimension data and tolerances.

Both J-M Sales Engineers and Authorized Distributors are friction specialists. Their advice on any problem dealing with the control of motion is yours for the asking. For your free copy of FM 35A—Friction Materials Guide—write to Johns-Manville, Box 14, New York 16, N.Y. In Canada, address Port Credit, Ont. Cable: Johnmanvil.

JOHNS-MANVILLE



WOVEN J-M Cone Facing being applied to a power take-off unit.
Circle 166 on Reader Service Card

SALES AND SERVICE . . .
continued

Oliver Corp.: Lloyd Tuttle has been designated manager of the Des Moines Div. of Oliver's Omaha branch.

Austin-Western Co.: The Construction Equipment Div. has named Harold J. Feekays district sales manager for the Tennessee, Arkansas, Mississippi, and Louisiana territories; Henry Ludwig as district sales manager for Minnesota and North and South Dakota; and Norval O. King as district service manager for Wyoming, Colorado, and New Mexico.

Hyster Co.: The International Div. has named Frank W. Burdell district sales representative for the Far East, with headquarters in Singapore; Russell L. Quesada as representative for northern South America, with headquarters in Bogota; and Peter K. Bourbeau as representative for south and west Africa, with headquarters in Johannesburg.

Associations

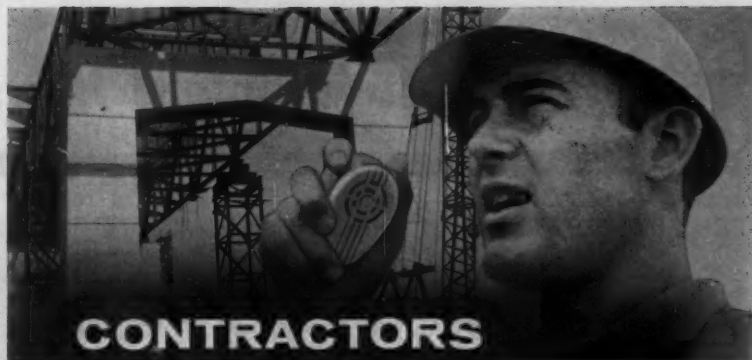
Construction Industry Manufacturers Association: The following officers were elected at the recent annual meeting: president, A. J. Lichtinger, Wellman Engr. Co.; first vice president, Buel M. Wallis, Shield Bantam Co.; second vice president, Robert E. Hunter, Detroit Diesel Engine Div. of General Motors Corp.; treasurer, Ray McLean, Jaeger Machine Co.; and secretary, Robert P. McKenrick, executive vice president of CIMA.

Special Mention

Calweld, Inc.: The Badger Tunnel Co., manufacturer of tunnel boring equipment, has been purchased outright by Calweld.

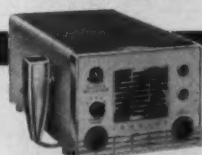
Allis-Chalmers: A new training center providing a factory-supervised training program for A-C construction machinery dealers' service personnel has been completed at the firm's Springfield, Ill., plant.

Muller Machinery Co.: A new division, the Mor-Flo Equipment Div., has been formed to develop an all-new line of mortar pumping equipment.



CONTRACTORS

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**MAYO
PNEUMATIC
GROUTER
and
"PEA
SHOOTER"**

Simple
to
Operate

Highly
Efficient



The Mayo Grouter quickly and easily places low-pressure grout in tunnels, mines, shafts, foundations, and subgrades. It also may be used to inject sodium silicate emulsions for stabilizing caving or running ground.

This versatile piece of equipment can readily be converted to a "Pea Shooter" for shooting Pea or "Bird's Eye" gravel back of liner plates and back-packing outside lagging plates.

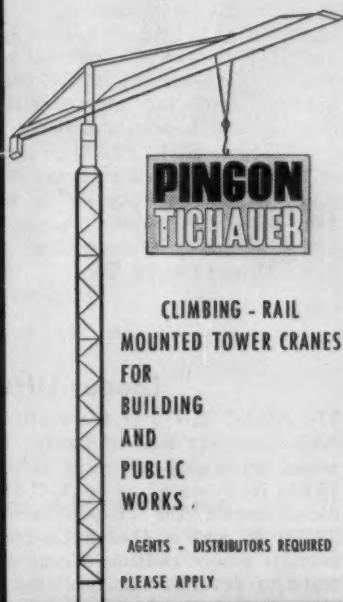
Write for Free Catalog 13 for full details and specifications.



MAYO
TUNNEL AND MINE
EQUIPMENT

LANCASTER, PENNA.

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Circle 304 on Reader Service Card

Construction Equipment News

For more information on any item, circle the key number, framed at the end of each item, on the READER SERVICE CARD just inside the back cover.



Big Truck Crane Handles 90 Tons

The P&H Model 890-TC can lift 90 tons and can take 200 ft of main boom and 50 ft of jib. Powered by a 280-hp diesel engine, the four-axle, 12-wheel carrier is 33 ft long. The crane has a 13½-ft vertical and 11-ft horizontal clearance without dismantling. The working weight of the 890-TC is 134,000 lb, but by removing the counterweight, outrigger housing and beams, and boom, the crane's weight can be reduced to 92,000 lb for traveling. Instead of friction swing clutches the machine has electromagnetic Magnetorque swing. More than 900 ft of 1-in.-dia cable is used to support the crane's boom and load.—Harnischfeger Corp., 4445 W. National Ave., Milwaukee 46, Wis.

Circle 301 on Reader Service Card

Loader Lifts 25,000 Pounds

The Model TL-30 is the sixth and largest in the Allis-Chalmers line of tractor shovels. This four-wheel drive unit can carry 10,500 lb and lift up to 25,000 lb. Powered by an A-C 184-hp, turbocharged diesel engine, the TL-30 has a breakout force of 28,000 lb and a 42-deg tip-back. A single lever permits power shifting at any speed in either forward or reverse. The machine is available with a choice of six buckets, ranging from 2½ to 6 yd. The unit features a maximum dumping clearance of 10½ ft. Among the available attachments are lift fork, backfiller blade, bucket teeth, and log tongs.—Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Circle 302 on Reader Service Card





Crane Rises as Job Progresses

Installed on a building's foundation, the Schwing climbing crane starts upward after the third-floor slab is placed. Six models are available with a maximum radius to 98 ft; at that radius the crane can lift 3,100 lb. The height of the crane jib above working level is normally 28 ft, and the standard hoisting height is 330 ft.—Vibro-Plus Products, Inc., Stanhope, N.J.

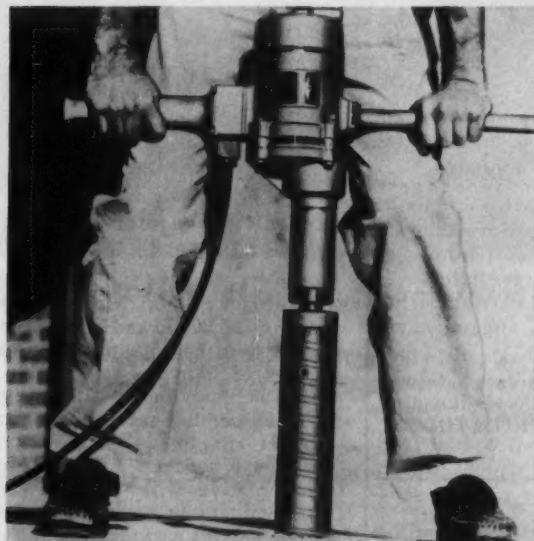
Circle 303 on Reader Service Card



Device Widens Track Gage

The Ditch Straddler permits widening of crawler track gage on Insley Models K and L draglines and backhoes. Made of structural steel, the member can lengthen the gage up to 15 ft. The conversion device is available either as original equipment or as a field change-over unit. Greater widths can be furnished for certain applications.—Insley Mfg. Corp., P.O. Box 167, Indianapolis, Ind.

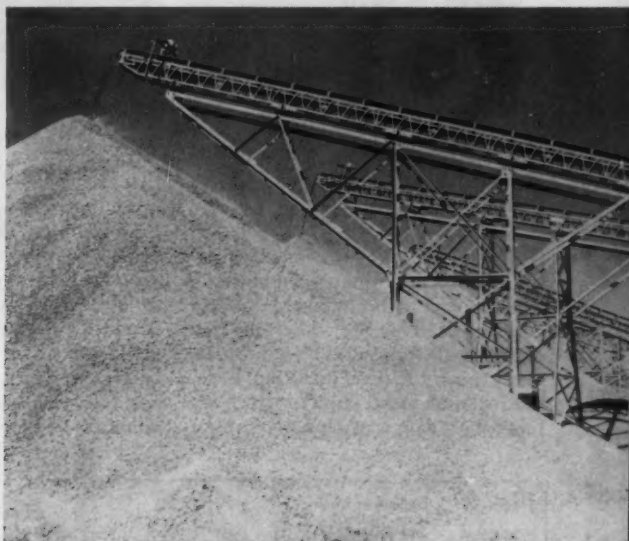
Circle 304 on Reader Service Card



Impact Drill Can Penetrate Concrete

Able to penetrate an inch of concrete a minute, the ROTO-IMP JL-200 is a waterless rotary impact drilling tool that weighs 30 lb and operates on a 115-v ac or dc outlet. Delivering 7,200 impacts a minute and rotating at 1,200 rpm, the ROTO-IMP drills holes from 1½ in. to 6 in. in dia and cuts through ¾ in. to ¾ in. rebars.—Tool Div., Bill Jack Scientific Instruments, Solana Beach, Calif.

Circle 305 on Reader Service Card



New Conveyors Added to Line

Lattice frame conveyor models in Cedarapids' new line are available in 18, 24, 30, and 36-in. widths and can be furnished in 2-ft increments to any desired length. The head and tail sections are 6-ft long and intermediate sections come in 8, 10, and 12-ft lengths. Rectangular end frames make a rigid joint between each section.—Iowa Mfg. Co., Cedar Rapids, Iowa.

Circle 306 on Reader Service Card

EQUIPMENT NEWS . . .

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.

Curbing Without Forms

This asphalt or concrete curber requires no forms or rails. Reinforcing longitudinal rods, pins or stakes, or a combination of pins and rods can be used with the machine. Pins are inserted in the pavement and horizontal rods



placed on top of the pins. The curber straddles them and compacts the material around them. The machine clears rods and pins that extend up to 4 in. above the pavement.—Dotmar Industries, Inc., 502 Hanselman Building, Kalamazoo, Mich.

Circle 307 on Reader Service Card

Hydraulic Boom

This hydraulic truck-mounted materials handling boom mounts behind the cab of a truck measuring 60 in. or more from the cab to the rear axle. The hydraulic



system consists of a pump fastened under the truck and driven by the truck pto. The boom lifts 6,000 lb when retracted and 3,500 lb when extended.—Henderson Mfg. Co., Manchester, Iowa.

Circle 308 on Reader Service Card



Largest Scraper of Line Hauls 125,000 lb, 52 yd

Largest scraper of the Euclid line, the Model SS-40, carries a payload of 125,000 lb and has a struck capacity of 40 yd and heaped capacity of 52 yd. Powered by a GM twelve-cylinder, 432-hp diesel engine, the scraper hauls at speeds up to 34 mph. It is equipped with an Allison Torq-matic Drive with four forward and two reverse speed ranges that provides full power shift. Torq-matic Brake, a hydraulic retarder to control speed on long down-grade hauls, is standard equipment. All scraper operations are completely hydraulic. The SS-40 makes a cut 11 ft 4 in. wide and down to 14 in. The tractor can be attached to a 40-yd/Euc bottom dump.—Euclid, Div. of General Motors, Hudson, Ohio.

Circle 309 on Reader Service Card

LOWEST PRICE,
MAXIMUM VALUE!



MARQUETTE
Star-Jet
REDI-PAC

Here's a medium duty oxy-acetylene welding and cutting outfit complete in its own tool box...known for quality because it's made by MARQUETTE.

Quality is the key to dependable, trouble-free performance—and that's what you get with famous Marquette equipment. This Star-Jet Redi-Pac contains all top-quality equipment, everything you need including hose, lighter, and most popular tip sizes (complete range of tips available).

The complete outfit comes in a rugged steel Redi-Pac tool box for safe carrying, convenient storage.

.....
And quality is the key to the amazingly smooth performance you'll get from Marquette's new two-stage oxygen and acetylene regulators... which feature only 8 moving parts, clocklike accuracy, rugged construction.

MARQUETTE'S complete catalogs will help you select the right equipment for your job. **WRITE TODAY:**



Full line of battery chargers and testers

Full line of oxy-acetylene welding equipment and supplies



Full line of A.C. Arc welding equipment and supplies



MARQUETTE

MARQUETTE MANUFACTURING CO. DIVISION OF MARQUETTE CORPORATION Minneapolis 14, Minnesota, U.S.A.
Circle 170 on Reader Service Card

**"Motorola
2-way radio
pays for itself
in less than
a year"**



Radio control of widespread operations pays off for Cleveland-Trinidad Paving Co.

What happens when equipment breaks down, or when you need material at the job site? You lose valuable time—perhaps several hours. Not at the Cleveland-Trinidad Paving Co., though. They just pick up the mike on their Motorola 2-way radio—and help is on the way in minutes. Victor Smukler, their General Manager reports that in everyday operations Motorola saves hundreds of dollars in wasted time, gas and oil formerly spent backtracking and phone hunting. He points out that with Motorola, one Supervisor does the work of several just "making the rounds." And customer relations have improved, too—because contractors can get in touch with key personnel **fast**. You've probably considered 2-way radio for **your** firm. There's no better time than **now** to get the facts. A Motorola radio specialist is waiting to help. Mail the coupon today.



MOTOROLA 2-WAY
RADIO

Motorola Communications & Electronics, Inc.

Dept. ACM115

A Subsidiary of Motorola, Incorporated,
4501 Augusta Blvd., Chicago 51, Ill.

- ☐ Mail me full fact kit on 2-way radio
☐ Have representative telephone for appointment

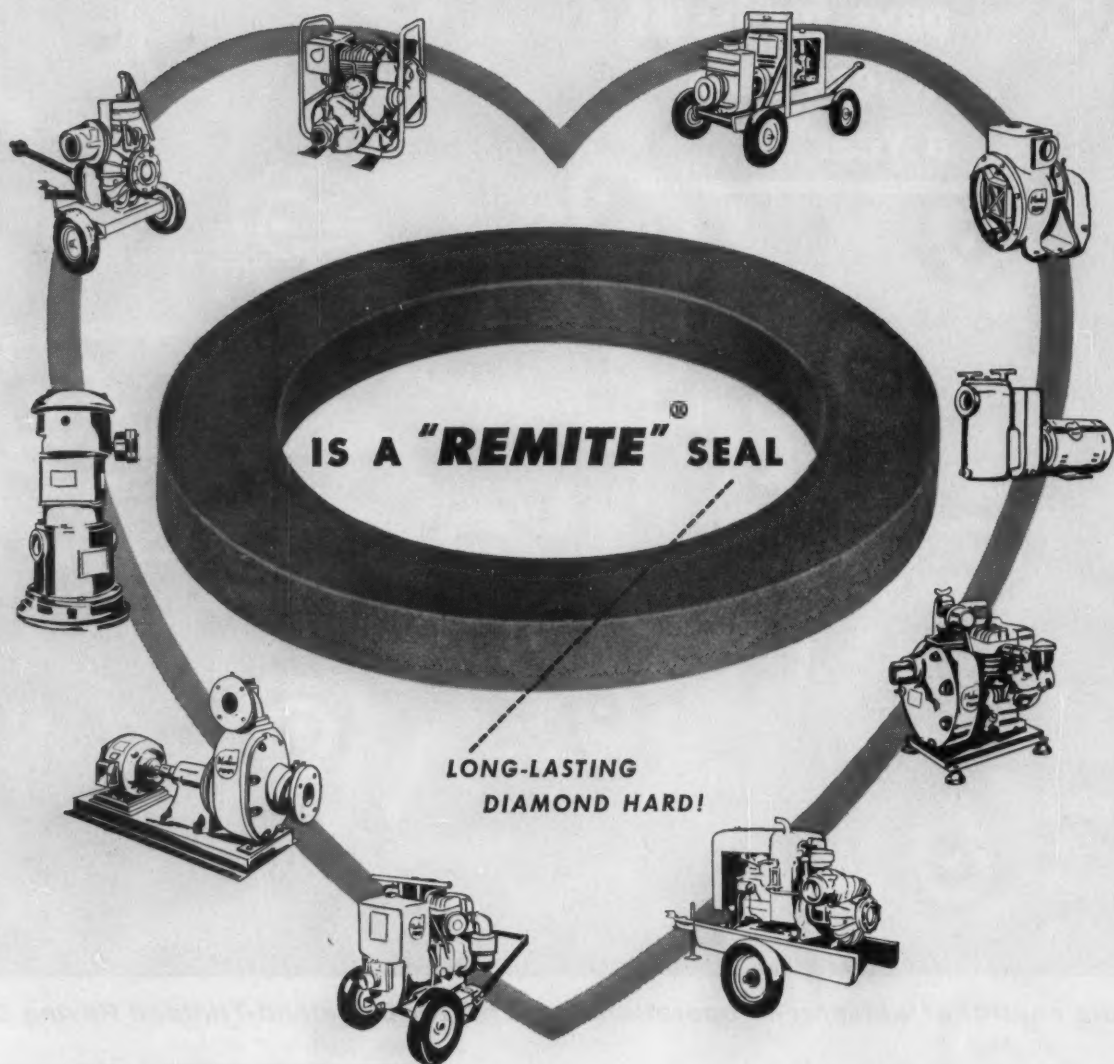
Name _____ Title _____

Company _____ No. of Vehicles _____

Address _____ Phone _____

City _____ Zone _____ State _____

THE **HEART** OF EVERY DEPENDABLE **MARLOW** PUMP...



Yes, Marlow's mechanical shaft seal is designed to keep the liquid where it belongs—inside the pump casing and not in the bearings or on the floor! A unique material, called "Remite," that was developed in the Research Laboratories of Bell & Gossett, helps make this possible. Remite is a material that is almost as hard as a diamond and is compatible with almost every liquid. Both of these properties help to make Marlow's mechanical shaft seal virtually leakproof and one of the finest

available anywhere in the world.

This premium seal is standard equipment on all of Marlow's self-priming centrifugal and end-suction centrifugal pumps. This is just one of many reasons why Marlow's offer a dependable and reliable solution to every pumping

problem. Because it is self-lubricating, routine maintenance is almost completely eliminated.

Today, research by Marlow and Bell & Gossett is constantly striving to make a good product even better to serve you with ever increased efficiency.

9-627



MARLOW PUMPS

DIVISION OF BELL & GOSSETT COMPANY

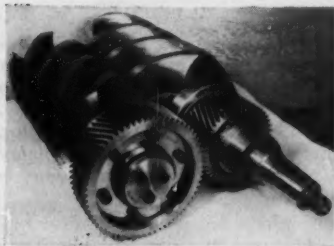
MIDLAND PARK, NEW JERSEY

Morton Grove, Illinois • Longview, Texas

Circle 172 on Reader Service Card

EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.



Pair of Rotors Compress Air in Screw-Type Units

Gardner-Denver's new series of portable screw-type air compressors, the Rota Screws, are offered with capacities of 125, 600 (shown), and 900 cfm. Each machine has a mechanism containing two rotors. The main one, which is directly connected to the engine, drives a secondary rotor that compresses the air before



discharging it into the receiving tank. The 600 and 900-cfm compressors are driven by Caterpillar diesel engines; the 125-cfm model is powered by a Continental gasoline engine. All three compressors operate under 100 psi. The 900-cfm model weighs 15,100 lb; the 600-cfm model, 10,150 lb; and the 125 cfm model, 3,150 lb. The firm is discontinuing its vane-type portable rotary compressors, ranging in capacities from 125 to 900 cfm.—Gardner-Denver Co., Quincy, Ill.

Circle 310 on Reader Service Card

Truck Tire

The Silvertown All-Purpose Traction tire features non-directional tread patterns that provide good traction for on and off highway vehicles. Made in both tyrex and nylon constructions, the tire has indented and staggered open-shoulder cleats.—B. F. Goodrich Tire Co., Akron, Ohio.

Circle 311 on Reader Service Card

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...and at amazing savings! The "Thermo-Fax" Brand Copying Machine—the world's most versatile business machine—now does even more new jobs. And look at the savings! *Black on white, bond-weight Systems Copies for less than 2¢ a copy. *Finished Paper Printing Plates for as little as 12¢. *Ready-to-Project Transparencies for as little as 13¢.

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Circle 173 on Reader Service Card

Across Dynamic Southern California...

SAN DIEGO GAS AND ELECTRIC CO. MEETS BOOM WITH GAR WOOD-BUCKEYE DITCHERS



San Diego is moving almost as fast as the jetliners and missiles made there. The population has nearly doubled in the past 10 years. In San Diego County, in 1959 alone, 28,788 new dwelling units were built. All this means plenty of work for the San Diego Gas & Electric Company.

To handle one of its toughest jobs—digging trenches for new gas lines—the company operates a rugged team of 12 Gar Wood-Buckeye ditchers.

Speed is important in gas line ditching—you have to match the fast pace of modern construction methods. And speed is what Gar Wood-Buckeye ditchers offer; speed, precision, and both ease and economy of operation.

Since their introduction, the Gar Wood-Buckeye 305, 307, and 308 utility ditchers have become recognized as the most modern wheel-type utility ditchers on the market. One reason is hydraulics—all three are equipped with a hydraulic wheel hoist and hydraulic conveyor drive as standard equipment. All three have main engine transmissions specially designed for ditcher use. All three have a split-shaft excavator drive for longer working life. And all three are operated with the simplest group of controls on any ditching machine.

From mammoth pipeline ditchers to the smallest utility machines, Gar Wood-Buckeye has led the field for more than 60 years.

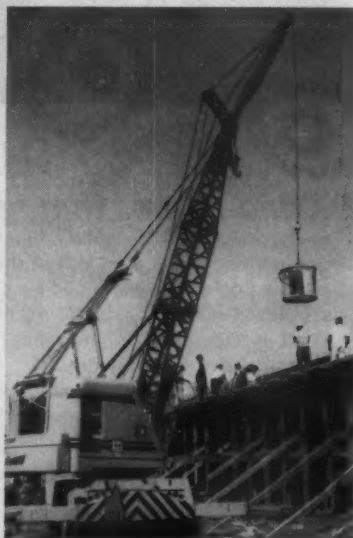
SAN DIEGO, RIVERSIDE LATEST TO CHOOSE GAR WOOD LOAD-PACKER



With an eye on both economy and efficiency of operation, sanitation officials in both Riverside and San Diego have chosen the Gar Wood Load-Packer 600.

Tremendous savings in refuse collection are possible with the Load-Packer. The reason: the Gar Wood unit packs between 25 and 50% more pounds per minute than any competitive machine. This speed of operation allows cities to use fewer machines for the same amount of work, and save thousands of dollars in labor costs each year.

Today, communities in every part of the world depend upon Gar Wood for efficient, economical, sanitary refuse collection.



San Gabriel Builder Calls Gar Wood Crane Key to Fast Pour Schedule

Gar Wood truck cranes are helping to keep large construction projects on schedule in many areas of southern California. An example is this unit, used by the Beckner Construction Co., Inc. of South San Gabriel for precision spotting of concrete buckets. The builder states the Gar Wood crane is "a major key to concrete poured on-schedule."



El Segundo Hauler Chooses Gar Wood Dump Bodies and Hoists

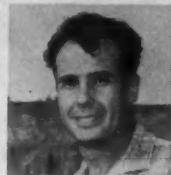
All types and sizes of Gar Wood dump bodies and hoists are in use throughout southern California. This unit was purchased by the Paramount Sand Co. of El Segundo for hauling blasting sand. The owner, Charles Settle, is shown talking with Phil Hanson, Los Angeles Gar Wood - St. Paul distributor. Gar Wood is the world's largest manufacturer of truck equipment.

GAR WOOD'S AT WORK!

San Diego Freeway Contractor Meets Breakneck Schedule with Gar Wood Hopper Trains



Southern California's road building program is on the move—and it's moving fast. More than 50 miles of freeway construction are projected for 1961. To a contractor involved in the program this means getting the highest possible production in the shortest possible time.



M. J. HOMEN

It's particularly true for Manuel J. Homen Trucking, Inc. of Upland—one of the largest dirt hauling contractors in California. Homen recently completed hauling 2.4 million tons of landfill for the San Diego Freeway project in record-breaking time. This contractor now is moving 3 million tons for another span of the freeway, under subcontract to the Griffith Co. of Los Angeles.

Again, time is of the essence. Homen's fleet of hopper trains is hauling 15,000 tons each day. Homen himself is so impressed with the production efficiency of Gar Wood hoppers that he recently purchased 11 new Gar Wood trains. His fleet now totals 30 trains—26 of which are Gar Wood.

"Competition in today's construction business demands equipment that will provide maximum payload, speed and versatility with minimum downtime," says Homen. "We're getting just that from our Gar Wood hopper trailers."

Homen's top-capacity payloads are made possible by the Mono-Shell construction of the Gar Wood hopper. Gar Wood has eliminated the heavy trusses found in other units and distributed the weight over a much greater axle span. In addition, Gar Wood's air-operated gates let Homen unload his hoppers while they are still in motion—sometimes as fast as 35 mph!

GAR WOOD INDUSTRIES, INC.

Wayne, Michigan • Findlay, Ohio

REVOLUTIONARY HYDRAULIC SYSTEM AT WORK ON LOS ANGELES SAND AND GRAVEL OPERATION

Gar Wood's revolutionary new Variacs pump, controlling a Gar Wood dozer blade on a Euclid C-6, is saving fuel and maintenance dollars for the Century Rock Co. of Los Angeles.

This variable volume piston pump delivers oil *only* when there's a job to be done. It allows the operator to meter tractor horsepower to the requirements of both blade and

crawlers, thus saving both horsepower and fuel. And because Variacs works less and works easier, it has a far longer working life.

Variacs virtually eliminates heat build-up, the main enemy of hard-working hydraulic systems. It is both faster and stronger—combining significantly greater lifting power with almost twice the blade speed at ground level of competitive hydraulic systems.





EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.

Earth Drill Fits Cranes

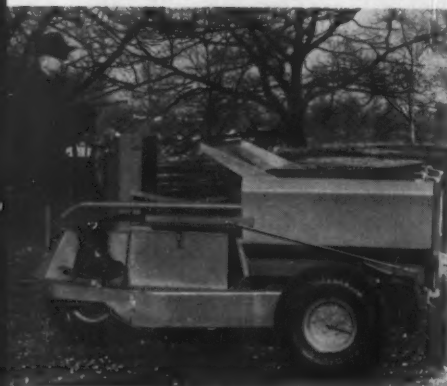
Any 1½-yd crawler or truck crane can be converted to an earth drill with the 150-C bucket-type attachment. The unit bores holes as large as 14-in dia to 200-ft depths at a rate up to 60 ft an hr. The bucket's capacity is 1½ yd. The attachment operates on either a gasoline or diesel engine, independent of crane power, by controls located in the cab. Also available is a drill attachment that fits ¾-yd crawler cranes or 1-yd truck cranes (*CM&E*, Aug. 1960, p. 164).—Caldwell, Inc., 7222 E. Slauson, Los Angeles, Calif.

Circle 312 on Reader Service Card

Wheelbase Can be Shortened

This 37-yd, 55-ton rear dump trailer has a variable wheelbase that shortens as the body is raised to dump position, permitting increased maneuverability in tight working areas. The Model TS-3755 dumps to an angle of 55 deg using hydraulic cylinders. Because the overall dimensions of the trailer and the design of the draft beam for the universal hitch vary according to the tractor, the TS-3755 is built to order only.—Easton Car & Construction Co., Easton, Pa.

Circle 313 on Reader Service Card



Battery Powers Buggy

Equipped with either a dump box or platform body, the BE-18 battery-powered electric truck can travel at three speeds in both forward and reverse and can carry up to 1½-ton loads. The capacity of the truck's dump box is 2/3 yd. Getman Bros., Inc., South Haven, Mich.

Circle 314 on Reader Service Card



Crane-Excavator for Versatile Duty

The Compact Bantam 250 handles five front-end attachments. All digging and lifting operations are cable operated, while the swing is controlled hydraulically. As a backhoe, the Compact Bantam will dig to a 13-ft depth. With a crane attachment, the machine will handle loads up to five tons and boom lengths to 45 ft. As a dragline, it will produce up to 85 yd an hr and up to 60 yd an hr with a clamshell. As a shovel, the unit will load as much as 90 yd an hr. A 135-hp Chevrolet gasoline engine powers the carrier, and a 37-hp Continental powers the upper unit.—Schield Bantam Co., Waverly, Iowa.

Circle 315 on Reader Service Card

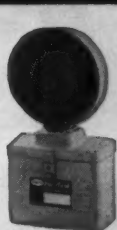
CONSTRUCTION METHODS

On **YOUR** jobs . . . play it **SAFE** . . .
with the **DIETZ 3-WAY**
Hazard Warning System!

Use **DIETZ**
VISI-FLASH
LIGHTS

to alert the
oncoming driver:

1 →



No. 695



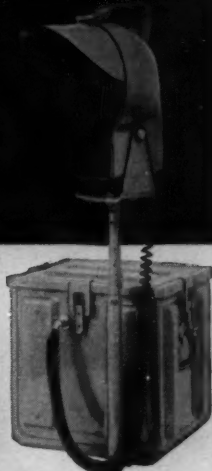
No. 665



No. 675



No. 610-PS



No. 685/971

Brightest, safest, most trouble-free flashers on the market. Warn: "Danger Ahead."

Use **DIETZ**
LANTERNS

to locate hazard
in relation to the
driver's position:

2 →



No. 1



No. 8



No. 100



No. 40

Show exact location, shape, extent, and boundaries of hazard area. Burn up to 100 hours.

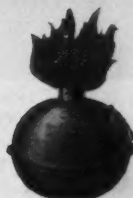
Use **DIETZ**
TORCHES

to guide driver
around the hazard:

3 →



No. 750



No. 87



No. 751



No. 96

Fully illuminate the danger in every weather. Burn up to 40 hours on low cost kerosene.

Go **DIETZ**
and
you go **Safely**

R. E. DIETZ CO.
Dept. 64, Syracuse 1, N. Y.

Please send me a copy of the
New Complete Catalog No. 61.

NAME _____
COMPANY _____
TITLE _____
ST. ADDRESS _____
CITY _____ ZONE _____ STATE _____



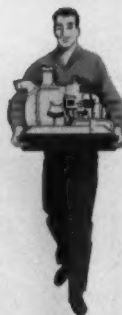


USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

The Mudder

You don't have to baby a Homelite Diaphragm Pump. It's a mudder . . . the most practical pump you can use for water thick with goo. Doesn't choke up with solids. It's designed to handle water heavy with mud, muck and sand at the rate of 5000 gallons per hour. Automatic self-priming. Guaranteed 28 feet suction lift. Total heads up to 50 feet, including friction. And it gets to the job just as fast as it does the job, for it weighs only 120 pounds. Can be carried to any location with money-saving ease.

Available with top-quality Homelite 2-cycle engine or 4-cycle Briggs & Stratton engine. Full on-your-job demonstrations are free at your request.

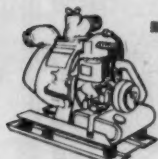


HOMELITE factory branches are located throughout the country. Your nearest one is as close as your phone. Call or write for convincing demonstration or rapid service in any way.

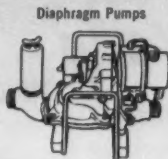
HOMELITE
CARRYABLE
PUMPS GENERATORS • CHAIN SAWS
BLOWERS

HOMELITE: A DIVISION OF TEXTRON INC. — 1004 RIVERDALE AVE., PORT CHESTER, NEW YORK • IN CANADA • TERRY MACHINERY CO., LTD.
Circle 178 on Reader Service Card

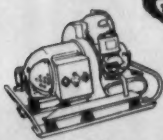
HOMELITE Factory Branches throughout the country sell and service Homelite's complete line of carryable construction equipment.



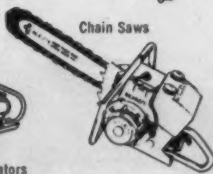
Centrifugal Pumps



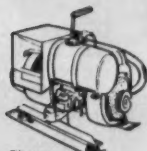
Diaphragm Pumps



Electric Generators

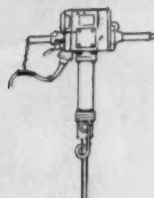


Chain Saws

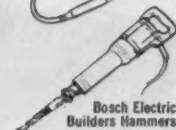


Vibrators

Blowers



Bosch Electric Paving Breakers



Bosch Electric Builders Hammers



Bosch Electric Rock Drills

HOMELITE FACTORY BRANCHES

EAST: CONNECTICUT: Greenwich, Hartford • NEW JERSEY: North Arlington, Woodbridge • NEW YORK: Albany (Latham), Buffalo, New York (North Arlington, N. J.), Rochester, Syracuse • MAINE: Orono • MARYLAND: Baltimore • MASSACHUSETTS: Boston (Allston) • PENNSYLVANIA: Altoona, Erie, Harrisburg, Hazleton, Philadelphia, Pittsburgh, Malvern • VIRGINIA: Arlington, Richmond, Roanoke • WEST VIRGINIA: Charleston, Clarksburg

SOUTH: GEORGIA: Atlanta • FLORIDA: Jacksonville, Miami • LOUISIANA: New Orleans (Metairie), Shreveport (Bossier City) • NORTH CAROLINA: Charlotte, Raleigh • OKLAHOMA: Oklahoma City • TENNESSEE: Knoxville, Memphis • TEXAS: Dallas, Lufkin

MID-WEST: ILLINOIS: Chicago (Stone Park) • INDIANA: Indianapolis • MICHIGAN: Detroit, Grand Rapids • MINNESOTA: St. Paul • MISSOURI: Kansas City, St. Louis • NEBRASKA: Omaha • OHIO: Cincinnati, Cleveland, Toledo • WISCONSIN: Milwaukee

WEST: CALIFORNIA: Fresno, Los Angeles (Alhambra), Sacramento, San Francisco • COLORADO: Denver • OREGON: Portland • UTAH: Salt Lake City • WASHINGTON: Seattle, Spokane

HOMELITE

A DIVISION OF TEXTRON INC.
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In Canada:
TERRY MACHINERY CO. LTD.

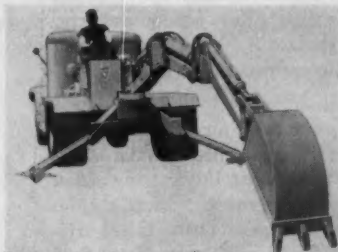
EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.

Clutch on Troweling Machine Gives Even Start

The sliding sheave-type clutch on the Model G34-4C HD Roto-Trowel eliminates grab and allows a slow, even start. Powered by a 4½-hp engine, the machine has a non-rotating, stationary guard ring that protects the blades and supporting arms from damage by obstructions. A knob on the handle allows the operator to adjust blade pitch while the machine is in motion. The model is furnished with four 6x10-in. finish blades and four 8x10-in. float blades—Stow Mfg. Co., 31 Shear St., Binghamton, N.Y.

Circle 316 on Reader Service Card



Backhoe Mounts On Truck

Any 2-ton or heavier truck chassis can be equipped with the ¾-yd 600TM Hydro-Trencher. It digs to a depth of 12½ ft and reaches 19 ft. The backhoe develops 38,000 lb of digging effort, and its clear dumping height is 12 ft. at a reach of 13½ ft. Powered by a 4 cylinder, 42-hp gasoline engine, the unit revolves 265 deg. Its lifting capacity at full radius is 2,200 lb.—Ware Machine Works, Inc., Ware, Mass.

Circle 317 on Reader Service Card

Clutches Offer Automatic Torque Modulation

Rockford's Power Shift hydraulic clutches, available in six sizes, can handle torque loads from 1,000 to 10,000 lb ft, engines up to 1,000 hp, and speeds up to 5,500 rpm. The clutches shift and engage in less than .6 of a sec and transmit only enough torque to complete the shift, then continue to maximum capacity.—Borg-Warner Corp., Rockford, Ill.

Circle 318 on Reader Service Card

Again...

SIMPLEX-WACO

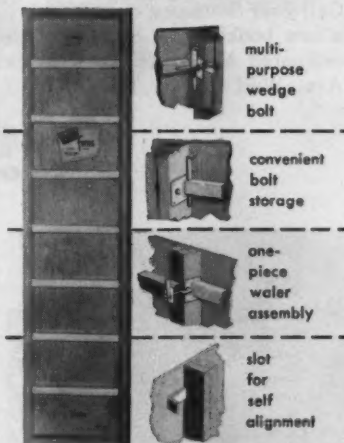
Comes Through on a Big One



adaptability and flexibility of Simplex-Waco Forms proved on giant shopping center

- Simplex-Waco Forms went up with ease in forming 32' battered wall and counterforts at suburban Minneapolis' Southdale Shopping Center.
- Robertson Q. panels nailed to Simplex-Waco panels to produce architectural finish in other parts of project.
- Forms were used both vertically and horizontally . . . proving Simplex-Waco flexibility! Over 26,000 sq. ft. of forms used on this project.
- Forms available on sales or rental/purchase plan.

DISTRIBUTORSHIPS OPEN IN CHOICE AREAS



Send Your Plans for Free Layout and Cost Estimate



SIMPLEX INDUSTRIAL FORMS, INC.

5629 Industrial Avenue
Rockford (Leves Park) Illinois
Circle 179 on Reader Service Card

plan savings with task forces of **SCHRAMM** CO-ORDINATED AIR POWER

How a change in thinking—and buying—can cut operating costs, increase profits on every job.

Here's a *saving* idea. Take a "project look" at your air-power purchases. Plan your investments to give you more work with the least equipment and manpower . . . with maximum interchangeability in equipment and maintenance parts.

That's exactly what SCHRAMM has done in its Co-ordinated Air-Power Package—which *also* offers you lower initial costs, maintenance costs, operating costs.

In fact, the entire SCHRAMM line has been planned and built to work together. Designed to do *more* work, *more* efficiently with fewer pieces of equipment. Whether a small compressor or a heavy-duty drill rig, every unit is compact, tough, highly mobile . . . with maximum interchangeability between engines and compressors, between products, between sizes.

Now is the time to take a long look at your total air-power picture. Don't let your equipment stable grow like Topsy . . . because the waste will, too. Weed out the nonproducers. Plan your buying toward a working package of SCHRAMM Air-Power equipment . . . Portable, Stationary, Self-propelled compressors, Rotary Drill Rigs, Hi-Pressure and Booster compressors, Construction Tools. Your first SCHRAMM unit will quickly show you the way to better project profits . . . and profits will multiply with each unit you add.

Call your SCHRAMM dealer. He's listed in the Yellow Pages. There's a new booklet waiting to tell you all the benefits of SCHRAMM Co-ordinated Air Power. Or write SCHRAMM, Inc., 604 North Garfield Ave., West Chester, Pa.

SCHRAMM CO-ORDINATED AIR POWER



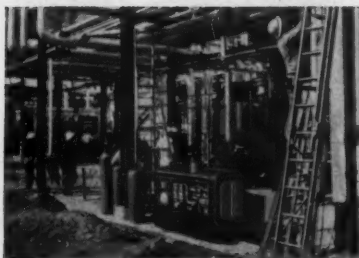
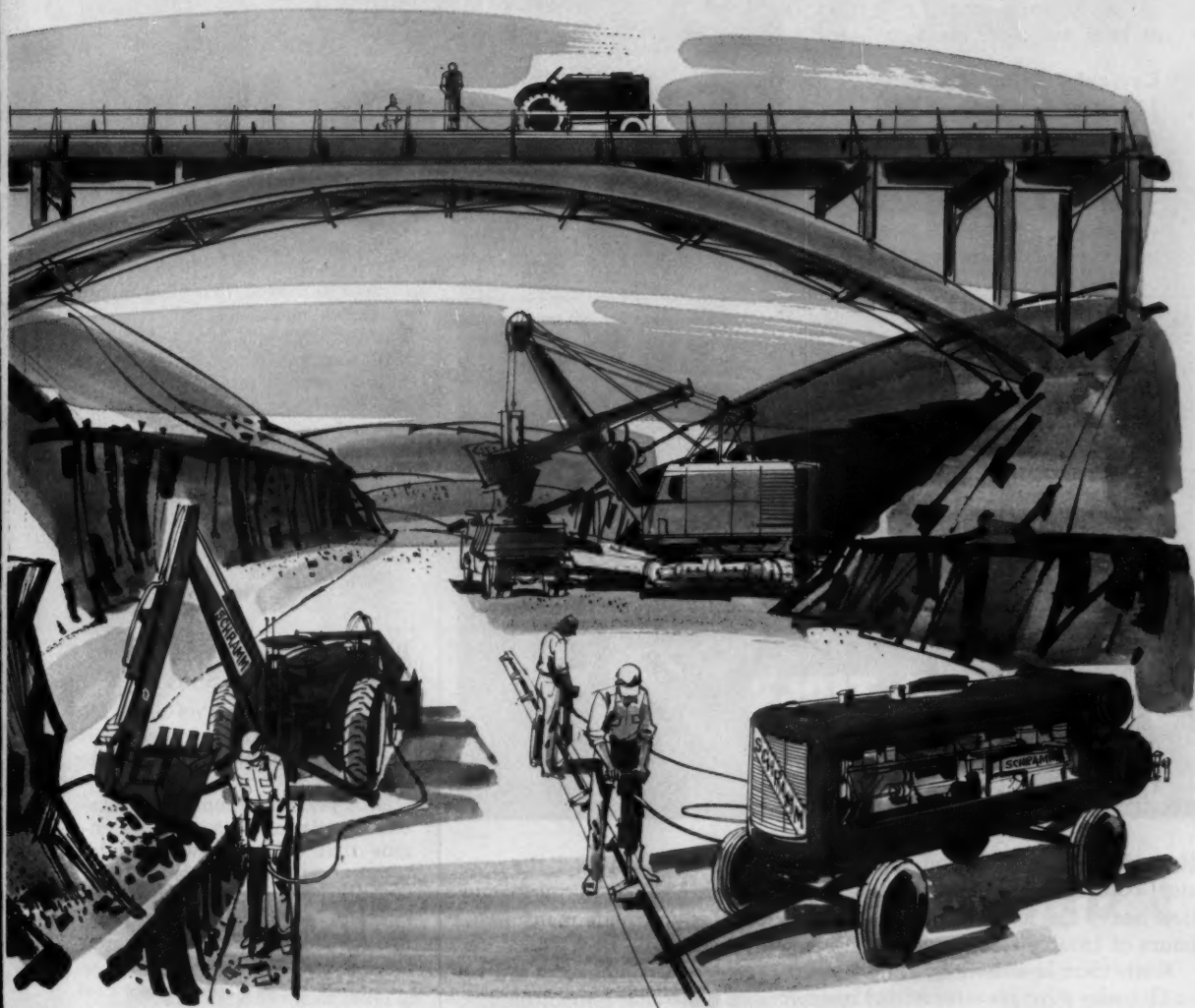
Portable Compressors save you up to 35% initial cost on 125 cfm compressors, comparable savings on every size from 20 cfm to 600. You also save 15 to 50% fuel consumption . . . get more air per unit of fuel. Air is hotter, you get more work per foot of air . . . tools operate at full capacity. Others use 40 gal. of oil to cool air. SCHRAMM uses none!



Pneumatractor Self-propelled Compressors cost less than comparable compressors and tractors combined! PNEUMATRACtors drive along with work. No trucks, crews tied up. With STANDARD or MODEL 250 PNEUMATRACtor, one man can break out concrete, tamp, drill, any job with air. With HEAVY PNEUMATRACtor, same man can dig, grade, fill.



Rotadrill Rotary Drill Rigs cost less too. With extra savings on PNEUMATRACtor ROTADRILL that has built-in compressor to replace separate crawler drill and compressor. Costs less, does same job as crawlers that use 315 or 600 cfm compressors. On ROTADRILLS, one man can do drilling job, change steels, drive from hole to hole.



Hi-Pressure Compressors are exclusive with **SCHRAMM! Vital** for jobs which require higher than normal pressures, such as testing small-diameter pipe lines. Units are dual purpose—can be used at normal pressures for regular work or at high pressures: 60 cfm at 500 psi; 200 cfm at 250 psi; 400 cfm at 250 psi! Available wheel or skid mounted.



Booster Compressors are the ideal package for the high-pressure, high-capacity air jobs such as major pipeline testing. Four basic units can be used individually or in combination to provide pressures ranging from 275 to 1500 psi, handling volumes from 600 to 1800 cfm. As with all Schramm equipment, you can buy or rent.



Construction Tools are mass produced to offer low initial cost for rock drills, breakers, clay spades, tampers and others. Combined with **SCHRAMM Compressors**, you get more air at the tool. More work is done. They provide faster operating speeds, lower up-keep costs, lower air consumption. All are made from drop forgings to give extra guts.

EQUIPMENT NEWS . . .

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.

Cycloidal Rotors Operate 1200-cfm Compressor

Ingersoll-Rand's 1200-cfm portable compressor incorporates cycloidal rotors driven by a GM 12V71 engine. The new compressor weighs 1,000 lb less and is no bigger than the current 900-cfm



Gyro-Flo model. The 1200 model is being manufactured at I-R's Painted Post, N.Y. plant. The firm will continue to manufacture its line of seven smaller-size Gyro-Flo vane-type portable compressors.—Ingersoll-Rand Co., 11 Broadway, New York 4, N.Y.

Circle 319 on Reader Service Card



STEEL CORD TIRES CURB DOWNTIME

Records from construction, logging and drilling firms prove off-the-road steel cord tires reduce downtime and cut operating costs—no matter how heavy the loads or how rugged the job. They provide many more hours of trouble-free service than conventional textile tires.

With thinner sidewalls, they run 20°F cooler. Yet sidewalls are up to 10 times stronger—for added resistance to blowouts, impact breaks, cutting and abrasions. They're fortified with 4 plies of 400,000 psi high tensile carbon steel wire from bead to bead. Steel cord tires have a double extra-ply rating—solid proof of strength and high load capacity.

New, technically improved steel cord tires make seldom-needed repairs easy.

Increase service hours and number of retreads by specifying tires made with Bekaert Steel Wire Cord.

Write for free data booklet

PLEASE SEND ME A COPY OF YOUR BOOKLET

Bekaert Steel Wire Corporation

655 MADISON AVE., NEW YORK 21, NEW YORK, DEPT. F

NAME _____ COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

BEKAERT STEEL CORD, ZWEEGEM, BELGIUM • Among Europe's Foremost Steel Wire Producers Since 1880

Circle 182 on Reader Service Card



Dry-Bulk Transport Offered in Three Sizes

Providing capacities up to 80,500 lb, the Highway - Interconsult dry-bulk transport is available with 300, 340, or 400-cu-ft vessels. A pneumatic unloading system, consisting of a gasoline engine that drives a two-cylinder compressor, empties 5 to 8 bbl a min. The discharge system operates at an unloading pressure of 28 psi.—Highway Trailer Industries, New York 17, N.Y.

Circle 320 on Reader Service Card



Roller's Bearings Run Through Oil Bath

Weighing 11,000 lb, the Ferguson Model 65 vibrating roller consists of a 5-ft dia, 6-ft-long drum unit and a 60-hp Deutz diesel engine. The eccentric shaft, driven by "V" belts, revolves at 2,300 rpm. A feature of the roller is that bearings and moving parts run in a continuous oil bath, thus eliminating most lube problems.—Shovel Supply, Dallas, Tex.

Circle 321 on Reader Service Card

CONSTRUCTION METHODS



NOT TOO TOUGH FOR A CLEVELAND J

HIGH, DEPENDABLE, DIGGING PRODUCTION in tough rock-digging like this shows how Cleveland J Trenchers pay off. On tough jobs or easy, on jobs of every kind, utilities, pipelines, footings, drainage, etc., Cleveland J's *dig more, dig better*—pay off because of Cleveland features like these:

- Over 30 positive, non-slipping, power-saving digging speeds—the right power-speed combination for every soil and condition.
- Positive, fast, full-range boom hoist.
- 1,000-hour-lubricated, 100% anti-friction-bearing-mounted track with dual drive and support—the world's finest trencher crawler.
- Big 16" x 3" hydraulic steering brakes.
- V conveyor with automatic side-to-side shift.
- Pulley-enclosed, dual, independent, hydraulic conveyor drive with instant control of discharge direction and speeds up to 1,000 FPM.
- Big 330+-cubic-inch engine.
- 100% control of every operation at operator seat with full job-visibility for the operator.

Whatever kind of trenching you do, a Cleveland J will pay off for you . . . dig more trench, in more places . . . at less cost. Check them now with your local distributor.



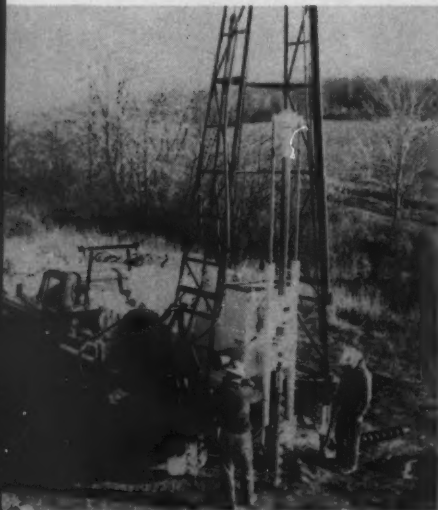
CLEVELAND TRENCHER

THE CLEVELAND TRENCHER CO., 20100 ST. CLAIR AVE., CLEVELAND 17, OHIO

Circle 183 on Reader Service Card

EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.



Combination Auger-Core Drill Mounts on Truck

The truck-mounted Acker SP augers to 300 ft and cores to 1,500 ft to produce up to 24-in.-dia holes. The rig has a four-speed cathead hoist, four-speed transmission, and hydraulically operated drill head, mast, and leveling jacks. The unit contains its own tool bins, water tank, and power unit. Either a 51-hp gasoline or diesel engine is available. Model SPT-68 is powered from the pto of a truck. The SP is full revolving, drills holes at any angle, and handles 5-ft hollow stem or conventional auger flights. It switches to roller rock, carbide, saw tooth, or diamond bit coring.—Acker Drill Co., P.O. Box 830, Scranton 2, Pa.

Circle 323 on Reader Service Card



Fork Lifts Offered in Three Capacities

Clark has added three new gas-powered, pneumatic-tired fork lifts with 6,000, 7,000, and 8,000-lb capacities to its line. Called Clarklift CFY-60, CFY-70, and CFY-80, the trucks feature synchronized friction clutch transmissions that permit shifting from forward to reverse without bringing the trucks to a complete stop. The machines are powered by Continental six-cylinder, 74-hp engines.—Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.

Circle 322 on Reader Service Card



Loader-Carrier Designed for Variety of Jobs

The Dyna-Lugger loads, lifts, and carries up to 15,000 lb with its lift arms retracted and 10,000 lb with its arms extended. Supplied with either a Hercules or Chrysler gasoline or a General Motors diesel engine, the unit has four-wheel steering, four-wheel drive, three speeds forward, and three speeds reverse. With its telescopic lift arms extended, the Dyna-Lugger can reach forward 11½ ft.—Lull Engr. Co., Inc., 3045 Highway 13, St. Paul 11, Minn.

Circle 324 on Reader Service Card



Ford Adds New Tractors

Two series of Ford tractors feature Red Tiger four-cylinder engines that are available with diesel, gasoline, and LP-gas fuel options. Engines for the Series 4000 are either 56 or 62 hp; the Series 2000 engines are 42 or 48 hp. A choice of transmissions is offered—power-shift or one of three constant-mesh systems.—Tractor and Implement Div., Ford Motor Co., Birmingham, Mich.

Circle 325 on Reader Service Card

THIS IS THE REPLACEMENT YOU NEED



Dependable RCA "LD" 2-Way Radio!

The construction industry was one of the first to latch onto the benefits of 2-way radio for controlling equipment on the job from headquarters, or for providing car-to-car contact. By thus maintaining a more efficient and flexible operation the savings have been big in time, in money. If you were one of these first users of 2-way radio, or even if you haven't taken the "radio step" as yet, now is a good time to look at the RCA "LD" 2-Way Radio equipment as an addition, replacement or an initial installation.

The new RCA "LD" mobile radio is modern, transistorized quality radio. Match it feature for feature, dollar for dollar—it's the best value you can get!

For construction and ready-mix operations, RCA "LD" will prove itself and pay for itself quickly out

of savings. Standard transistors are used in circuits where long experience proves their reliability, where they do the best job in cutting battery drain. Priced considerably below other transistorized 2-way radios, comparable in cost to conventional tube-type radios—the "LD" is today's best buy in 2-way radio equipment.

Lease or purchase plans. RCA authorized service available. Ask your RCA Representative for complete descriptive literature. Or mail coupon below.



The Most Trusted Name in Radio

RADIO CORPORATION OF AMERICA

RADIO CORPORATION OF AMERICA

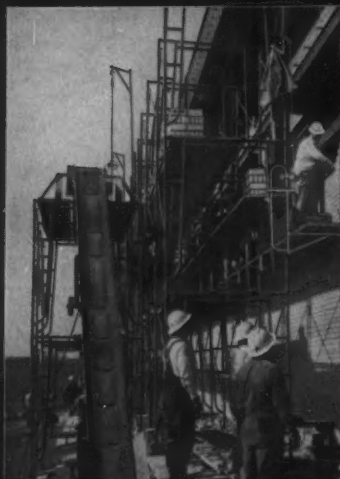
Telecommunication Center
Dept. T-203
Meadow Lands, Pa.

- ☐ Please send me FREE literature on the new RCA Transistorized "LD" Mobile Radio.
☐ Have RCA Communications Specialist contact me and explain why this is today's best value in 2-way radio.

NAME _____ TITLE _____
COMPANY _____
TYPE OF BUSINESS _____
ADDRESS _____ PHONE _____
CITY _____ ZONE _____ STATE _____



CUT MASONRY WALL COSTS

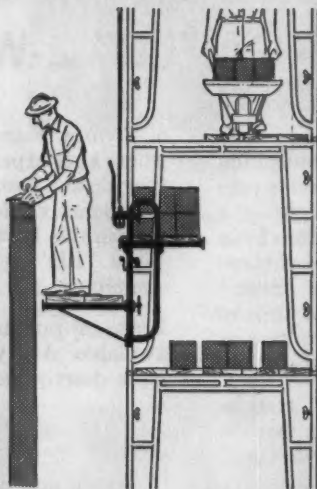


SAFWAY MOBIL-BRACKET method

gives you important bid advantages

masons and materials go up with the wall to increase job speed and efficiency

- **masons**
always level with the wall.
- **materials**
always at waist level.
- **wheeling**
platform for tenders.
- **platform**
for advance material storage.
- **no delays**
for re-rigging at higher levels.



SAFWAY STEEL PRODUCTS, INC.
6228 W. STATE STREET
MILWAUKEE 13, WISCONSIN

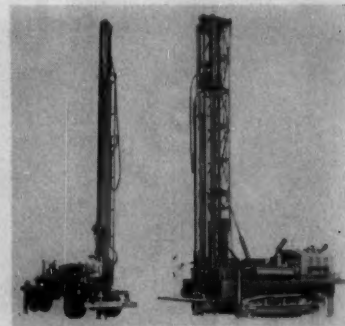
WRITE
FOR
BULLETIN
54-A



Circle 186 on Reader Service Card

EQUIPMENT NEWS . . .

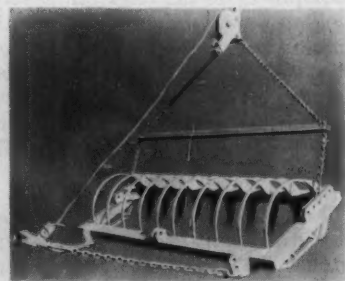
For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.



Rotary Drills Develop High Torque, Steady RPM

For use in rotary or down-the-hole drilling, Le Roi's LRD-2 (left) and LRD-3 (right) mechanical drive rotary drills handle bit sizes of 3 to 4½ in. and 6 to 7½ in., respectively. A gasoline or diesel engine can be mounted on either truck, crawler, or wheel-mounted rigs. Through gear reductions in the drive shaft that produce high torque, the LRD-3 maintains steady drilling action and constant rpm on the bit at low engine speeds. The LRD-2, a one-man rig, drills down to 25 ft without changing pipe. Holes to 100 ft can be drilled by adding drill pipe.—Sales Dept., Le Roi Div., Westinghouse Air Brake Co., Sidney, Ohio.

Circle 326 on Reader Service Card



Rake Attachment for Dragline Applications

The Basket Rake is designed to replace a dragline bucket for removal of roots and vegetation. The 9-ft-wide rake weighs 1,500 lb and can be attached to a ½-yd machine in a similar fashion as a dragline.—Insley Mfg. Corp., P.O. Box 167, Indianapolis 6, Ind.

Circle 327 on Reader Service Card

CONSTRUCTION METHODS



Autocar

"World's Finest"

AUTOCAR planetary gear-drive AP-15's in foreground and AP-25's in background have great job stamina. Payload ratings 15 tons and 25 tons, respectively.

Built to haul at sure profit ...that's Autocar

Nothing does the rough-and-ready hauling job like Autocar, because no one else builds like Autocar.

Each Autocar is fully custom-engineered and precision built to do its assigned job with utmost efficiency. Long experience, advanced engineering and flexible manufacture

produce just the truck that will earn most for you.

And every Autocar is built to the highest quality standards—beginning with extra-strength frames—including high capacity power trains for maximum top speeds consistent with the job to be done.

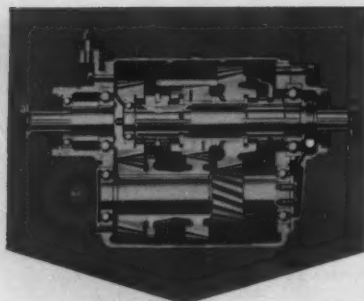
Autocar builds a wide range of planetary gear-drive, rear-dump trucks with payload ratings from 12 to 40 tons. They're ahead in maneuverability, strength, safety, comfort, long life—and ability to maintain scheduled trip cycles. Take Autocar, nothing less.

Autocar

"World's Finest"

Division of
The White Motor Company
Exton, Pa.

Circle 187 on Reader Service Card



Specify FULLER Specify the MODEL

For heavy duty
trucks and tractors specify the
FULLER '92 SERIES
3-SPEED AUXILIARY

- High capacity
- Widest range of ratios
- Top-mounted power take-off optional
- Low initial cost, reduced maintenance
- Available from all truck manufacturers on specification

92 SERIES (Heavy-Duty) RATIOS			
	SPLITTER RATIOS		DEEP REDUCTION
MODEL	High	Inter- mediate	Low
3-A-92	.74	1.00	2.09
3-B-92	.84	1.00	1.24
3-C-92	.75	1.00	2.64
3-D-92	.75	1.00	1.24
3-E-92	.84	1.00	2.09
3-F-92	.84	1.00	2.64
3-G-92	1.00	1.327	2.09
3-H-92	1.00	1.327	2.64

Specify



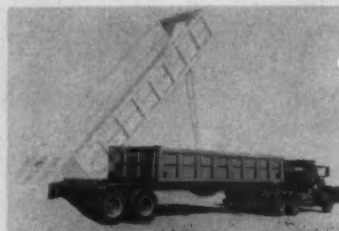
Specify the MODEL

**FULLER TRANSMISSION
DIVISION**
EATON MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN

Circle 188 on Reader Service Card

EQUIPMENT NEWS . . .

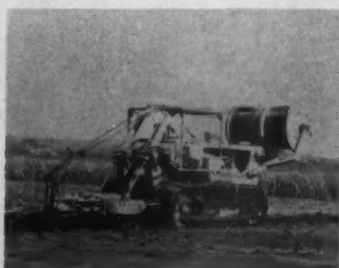
For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.



Trailer Positions on Chassis

The Pay-Pac Dump trailer uses a four-section, telescopic hydraulic hoist to position the 24-ft body on the 35-ft chassis and to dump the payload. From its predetermined transport position, the body is hydraulically moved to the rear, where it automatically locks for dumping. After the load is discharged, the body returns to and locks in its forward position. — Spencer-Loadcraft, Inc., Augusta, Kan.

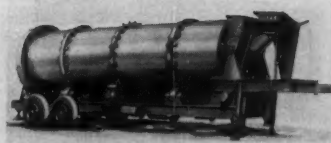
Circle 328 on Reader Service Card



Cable Layer Fits Tractors

The Kelley cable laying attachment can be mounted on all Caterpillar crawler tractors equipped with Cat hydraulic control units. The attachment lays any cable or wire up to 3½-in. OD at depths ranging from a 12-in. minimum with the Cat D4 to a 72-in. maximum with the D9. The laying shank is far enough behind the tractor to permit unrestricted maneuvering without deviating from the cable line. Vertical movement of the tool bar is attained by two 7-in. hydraulic cylinders with 48-in. stroke. Cable reel carriers are front mounted and are made for specific applications. Full reels of cable, weighing up to 7,000 lb, are automatically unreeled by the drag or pull on the line. Kelley Products Div., P.O. Box 2073, Houston, Tex.

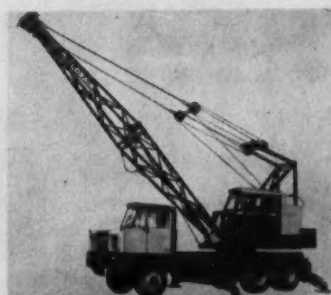
Circle 329 on Reader Service Card



Dryer-Dust Collectors For Asphalt Plants

Barber-Greene's expanded line of Dryerpacs, dryer-dust collector combinations, includes 27 capacity ranges in both portable and stationary models. The units feature drum diameters and lengths from 5 ft x 20 ft to 9 ft x 30 ft, three to twelve cone dust collectors, and air flow capacities from 12,500 to 54,000 cfm. — Barber-Greene Co., Aurora, Ill.

Circle 330 on Reader Service Card



Lorain Adds 25-Ton Crane

Latest addition to Lorain's Moto-Crane line is the 25-ton Model MC-325. Two, tandem, driven rear axles provide 15 speeds forward up to 47 mph. There are three speeds in reverse. The MC-325 can be equipped as a crane with a 110-ft boom, clamshell dragline, shovel, or hoe. — The Thew Shovel Co., Lorain, Ohio.

Circle 331 on Reader Service Card



Truck Bed Lowers, Tilts

This hydraulic semi-trailer can be lowered to the ground, leveled with any loading dock, and tilted forward, backward, or to either side. The trailer can be operated with power from the tractor or it can be equipped with a power kit of its own. An 18-ft unit with a 20,000-lb net payload costs \$5,500. — Hi-Lo Truck Corp., 681 Market St., San Francisco 5, Calif.

Circle 332 on Reader Service Card



Only eight hours transmission downtime per unit in approximately 2700 hours of operation over a period of 2½ years averages out to

99.71% AVAILABILITY!

A. F. Keyes Co., Inc., South Milwaukee, Wisconsin, is using Fuller 5-G-1520 5-speed Transmissions in four Le Tourneau-Westinghouse Scrapers on construction projects in southwestern Wisconsin. None of the four units has had more than eight hours of transmission downtime—and each has logged more than 2700 hours of operation.

Two of Keyes' L-Ws are Model B

Full Packs, and two are Model B BM-2s. The constant-mesh, spur-gear Fuller 5-G-1520s feature, as standard equipment, the Fuller air-actuated countershaft brake, which permits quick, easy up-shifts without double clutching. Also standard on the 5-G-1520 is the Fuller pressure lubrication and filtration system, which keeps gear oil clean, provides longer gear and bearing life and increases avail-

ability for your operation.

Bernard Schuh, Chief Mechanic for Keyes, says, "We're extremely pleased with both the performance and reliability of the Fuller 5-G-1520 Transmission. If you buy a good piece of equipment and take care of it, it's going to perform profitably for you. And that's certainly the case with the Fuller Transmissions in our LeTourneau-Westinghouse Scrapers.

FULLER TRANSMISSION DIVISION
EATON MANUFACTURING COMPANY 
 KALAMAZOO, MICHIGAN

Sales & Service: West. Dist. Branch, Oakland 6, Cal. • Southwest Dist. Office, Tulsa 3, Okla. • Automotive Products Co., Ltd., Brock House, Langham St., London W.1, England, European Rep.
 Circle 189 on Reader Service Card

EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.



Four-Wheel Concrete Buggy

Aeroil's 10-cu ft power buggy is mounted on two pneumatic-tired front wheels and a pair of steel rear wheels. The 550-lb machine travels in either direction at speeds up to 5 mph. The bucket is equipped with a splash guard and is interchangeable with a flat pallet for carrying brick and block.—Aeroil Products Co., Inc., 13 Wesley St., S. Hackensack, N.J.

Circle 333 on Reader Service Card



Scraper Mounts Cat Grader

This new, large Graderscraper fits in place of the blade and circle on Cat motor graders. The GS-40, a 4-yd (heaped) scraper, carries ½ yd more than the previous model. Optional sideboards are available to increase the capacity. The scraper can be tilted to either side of the machine to cut ditch sides while the grader runs level. When tilted, it will cut 24 in. below ground level to form one side of a "V" ditch. It can be shifted to cut on an angle of 30 deg and shifted 9 in. outside the grader wheels.—Martin Co., 620 Andrews Ave., Kewanee, Ill.

Circle 334 on Reader Service Card

Kit Converts Crawler Crane

Through the use of conversion kits contractors can change Manitowoc's Models 3900, 4000, and 4500 liftcranes from crawler units

to gantries. The user simply unbolts the crawler assemblies and slides them off and then bolts the crane carbody on top of the gantry mount. When it is no longer necessary to use the crane on the gantry, it is taken off that mount and the crawlers bolted back on.—Manitowoc Engr. Corp., Manitowoc, Wis.

Circle 335 on Reader Service Card



Electric Controls Operate Float Attachment

Towed by the Model SW-100 concrete finisher, this float attachment is operated by push-button control linked directly with the finisher's control panel. The telescopic frame on the Model SW-150 attachment permits automatic widening from 12 to 28 ft.—Blaw-Knox Co., Milton, Ill.

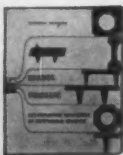
Circle 336 on Reader Service Card

To the contractor considering concrete precasting:

LET FMC HELP YOU



Send for your free copy of the #400 Form-Crete Catalog. Describes the entire form line and is a handy reference.



- WITH FORMS FOR ON-THE-JOB CASTING
- WITH FORMS FOR YOUR CENTRAL PRESTRESSED YARD
- WITH CUSTOM FORMS FOR SPECIAL PRODUCT SHAPES
- WITH FORMS THAT KEEP PRODUCTION COSTS DOWN
- WITH FORMS FOR CASTINGS OF UNIFORM ACCURACY

Successful casting operations depend on forms that will produce uniform accurate members that consistently meet specifications. Get started right — with FMC Form-Crete steel casting forms. FMC offers a broad line of quality forms backed up by years of valuable form design experience. FMC's capable engineering force and field engineers are at your disposal for facts and figures on form design. Before you bid — contact FMC. Get the benefit of experienced engineering, superior service and quality Form-Crete forms.

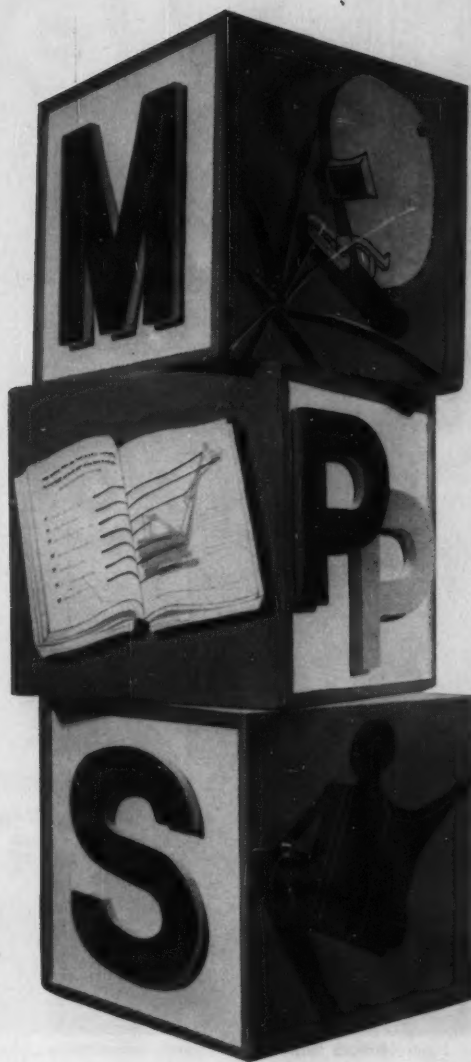
Putting Ideas to Work



**Form-Crete
Department**

General Sales Offices:
Lakeland, Florida

Circle 190 on Reader Service Card



S stands for service . . . service to you as a customer. Marion service is built from a number of solid blocks. It starts with a product that can take sustained rugged performance. It includes good maintenance manuals for your operators and machines. It includes availability of skilled service men from distributors and Marion field offices. And it's backed up by home office people and policy that recognizes the importance of service to you. As in our logo, all-around Marion service is the foundation for the big, low-cost output available to you from Marion.

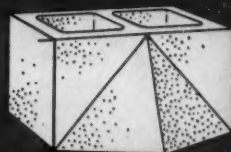
MARION POWER SHOVEL COMPANY MARION, OHIO

A Division of Universal Marion Corporation

Marion • Performance • Parts • Service

Circle 191 on Reader Service Card

► **Great new things
are shaping up in concrete block**



"Hi-Lite" concrete block (with either single or double projections) are available from local block producers.

Atlas Masonry Cement provides the right mortar

A sculptured stone look is produced with decorative "Hi-Lite" concrete block here in single half-pyramid design. In exposed masonry construction, the projected face of this unit creates unusual highlights and shadows, pyramids, prisms, diamonds, gables. □ For laying up "Hi-Lite" block, as with other masonry units, ATLAS MASONRY CEMENT continues to be the preferred cement for mortar. It produces a smooth, workable mix, provides a strong bond, gives weathertight joints that are uniform in color. And ATLAS MASONRY CEMENT complies fully with ASTM and Federal Specifications. For information on masonry cement write: Universal Atlas, Dept. M, 100 Park Avenue, New York 17, N. Y.

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**Universal Atlas Cement
Division of
United States Steel**

M-83

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COMMENT from the BUTLER ENGINEER

... Of a Giant Expansion to Meet Cement Demand

One of the great cement companies—with a confident eye to the immediate future—has just entered upon a nation-wide, multi-million dollar program in expansion and the establishment of new supply centers. It's big. And it means a whale of a lot to you—Mr. Ready Mix, Mr. Concrete Products and to you—Mr. Roadbuilder. First, because the program is based upon a careful study of immediate demand for cement. Second, because you will profit enormously from this activity. Companies of this magnitude don't bet millions if the future looks uncertain.

And we're glowing because those storage bins are made by Butler. Each line of 4 bins holds 8289 cu. yds.—and there are 9½ lines. And all are equipped with Butler Gates and Airflowmatic Feeders.

Incidentally, just to show you versatility in metals which Butler fabricates, we recently completed 5 aluminum bins, each of 392 yards capacity, for a large chemical company. It was a solution to a contamination problem. So what metal do you want? Let us know.

The Concrete Masonry Exhibits in the handsome and newly completed Cobo Hall, Detroit, was a lively and inspiring success... but there were many who figured it would be a colossal flop. Trouble stemmed from a jurisdictional misunderstanding by the unions. Really not intentional; it was born of inexperience in routines attendant upon a big machinery show. Situation beautifully and diplomatically handled by Mayor Miriani, and by a rational attitude by the unions—once they understood.

Recession? Man! We're busy.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

Circle 305 on Reader Service Card

New Product Briefs

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.

SOIL METER, the PVC, measures maximum possible volume change that sample could undergo due to swelling or shrinkage when subjected to changing moisture conditions.—Soiltest, Inc.

Circle 400 on Reader Service Card

MAGNETIC SWEEPER picks up steel parts, filings, nails, etc. The Sweeperette is powered by an Erium magnet mounted on neoprene wheels and is propelled in carpet sweeper fashion.—Eriez.

Circle 401 on Reader Service Card

TESTING MACHINE for cement blocks and beams has three load ranges: 600 lb, 12,000 lb, and 24,000 lb. Speeds up to 3 in. a min are controlled by micrometer needle load valve.—Tinius Olsen.

Circle 402 on Reader Service Card

JIG SAW cuts plywood, plastic, and metal. The blade on the Model 456-01 Cummins sabre-saw is pitched to cut on the upstroke and clear chips on the downstroke. Price: \$29.95.—Oster.

Circle 403 on Reader Service Card

SCRAPER, the TS-160, has been redesigned to increase capacity to 8½ yd struck and 11 yd heaped with 13-ton payload. The TS-160 is powered by an A-C 155-hp diesel.—Allis Chalmers.

Circle 404 on Reader Service Card

BULL HORN is a compact voice amplifier weighing 2½ lb and using 1½-v flashlight cells. The Rangerhorn's voice signaling range is 2,000 ft. It retails for \$14.95.—Electrosolids Corp.

Circle 405 on Reader Service Card

SLIDE RULE KIT contains parts for making three basic slide rule blanks, plotting ruler, logarithmic chart, and 25-p. book that tells how to make special-purpose rules.—Dyna-Slide.

Circle 406 on Reader Service Card

BACKFILL BLADES for Hopto's excavator Series 500, 200, and 110 range from 4 ft, weighing 130 lb, to 8 ft, weighing 490 lb. The

PROF

McGOWAN has a
pump for every job

from the
1" PA...



PUMP MODEL G.P.H. CAPACITY

LIGHTWEIGHT

1" PA	1,500
5 MA	5,000*
2" PA	8,000
8 MA	8,000*
10 MA	10,000*
17 MA	17,000*
20 MA	20,000*

CLOSE-COUPLED ELECTRIC

1" PE	1,500
1½" PE	4,500
2" PE	9,000

DIAPHRAGM

33 DL	4,200*
33 DH	4,200*
33 DHB	4,200*
44 DH	6,000*
44 DHB	6,000*

HI-PRESSURE

2 H	9,420
3 H	30,000
4 H	40,000
6 H	90,000
8 H	144,000

CONTRACTOR

5 M	5,000*
8 M	8,000*
10 M	10,000*
17 M	17,000*
20 M	20,000*
30 M	30,000*
40 M	40,000*
90 M	90,000*
125 M	125,000*

*AGC Rated Capacity

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the
125 M



YOUR
BEST
BUY...

McGOWAN PUMPS

Div. of Leyman Mfg. Corp.
10948 Kenwood Rd.
Cincinnati 42, Ohio

Circle 193 on Reader Service Card

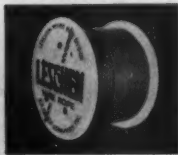
we need 500 feet of $\frac{3}{4}$ " wire rope!

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LESCHEN
Red-Strand



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The man who uses wire rope knows that Leschen quality and service give best results—that Leschen Wire Rope keeps production on the move—that Leschen will make sure it's the right rope for his need. • To be *safe* and *sure* call your Leschen distributor for expert advice on your wire rope needs. For further details and literature, write Leschen Wire Rope Division, 2727 Hamilton Avenue, St. Louis 12, Mo.



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**LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY INC.**

Porter serves industry with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

Circle 194 on Reader Service Card

NEW PRODUCT BRIEFS

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.

blades fasten onto the bucket.—Badger Div., Warner & Swasey.

Circle 407 on Reader Service Card

CRAWLER, TD-20, is second largest of International line. It is equipped with 140-hp diesel, six-speed transmission, and weighs 29,700 lb. Drawbar pull is 113 hp.—International Harvester.

Circle 408 on Reader Service Card

MOTOR SCOOTER for off-highway travel weighs 129 lb and is powered by 3-hp Briggs and Stratton engine. The Moto-Burro has 49-in. wheelbase and travels at top speed of 6 mph.—Sports Industries.

Circle 409 on Reader Service Card

ROLLING SCAFFOLD weighs 96 lb and has 2x6-ft platform that can be adjusted in 2-in. height increments up to 6 ft 1 in. and can take a 400-lb concentrated load.—Tubular Structures Corp.

Circle 410 on Reader Service Card

CONTROL SYSTEM, the UBC-100, for batching plants has signal mechanism to convert dial scale movement into voltage and control system to transmit the signal to operate batcher gates.—Blaw-Knox.

Circle 411 on Reader Service Card

FORK LIFT with three-stage mast is offered in 2,000, 3,000, and 4,000-lb capacities in both the Straddle and Reach Fork models. The 72-in.-high 2,000 model will reach 147 in.—Raymond.

Circle 412 on Reader Service Card

PORTABLE SAWS, Skilsaw Models 367, 77, and 825, have blades $6\frac{1}{2}$ in., $7\frac{1}{4}$ in., and $8\frac{1}{4}$ in., respectively, that allow cutting depths of $2\frac{1}{2}$ in., $2\frac{1}{2}$ in., and 3 in. Prices: \$110, \$125, \$150.—Skil.

Circle 413 on Reader Service Card

FASTENING TOOL, R-375 Shure-Set, formerly sold with drill holder as standard equipment, is available without holder. The hammer-in tool places threaded studs, drive pins. Price: \$10.50.—Ramset.

Circle 414 on Reader Service Card

CONSTRUCTION METHODS



Only Spencer uses military type underwater tests to determine the relative effectiveness of commercial explosives. These tests are the latest in a continuing research program conducted by Spencer Chemical Company, the pioneer supplier of solid ammonium nitrate as an ingredient in blasting.

Precise new underwater testing method shows . . .

Spencer N-IV And Fuel Oil Produces Up To 7 Times As Much Useful Energy Per Dollar

. . . when compared with gelatin dynamites

How do you measure the true blasting effectiveness of commercial explosives? Unsatisfied with present methods, Spencer Chemical Company and a well known research organization teamed up to discover a better way.

After extensive investigation Spencer adopted underwater testing methods developed through military research. These were found to provide data better related to commercial blasting than any other testing method. As a result, more accurate standards of evaluating the actual useful output of explosives have been developed.

Latest test results show that Spencer N-IV Ammonium Nitrate and fuel oil deliver up to seven times as much useful energy per dollar as gelatin dynamites (see chart at right).

Extensive research has also shown that Spencer N-IV, when mixed with the recommended 6% fuel oil, delivers 20% to 25% more blast energy than equal charges of other solid ammonium nitrate-fuel oil mixtures. There are two main reasons for this: (1) lower density which provides greater ease of detonation, (2) special prill structure which allows fuel oil to be absorbed more evenly.

It costs you nothing to get the full benefits of Spencer's advanced knowledge and experience in this field. Just mail this coupon. No obligation of course.

PERFORMANCE COMPARISON OF BLASTING MATERIALS

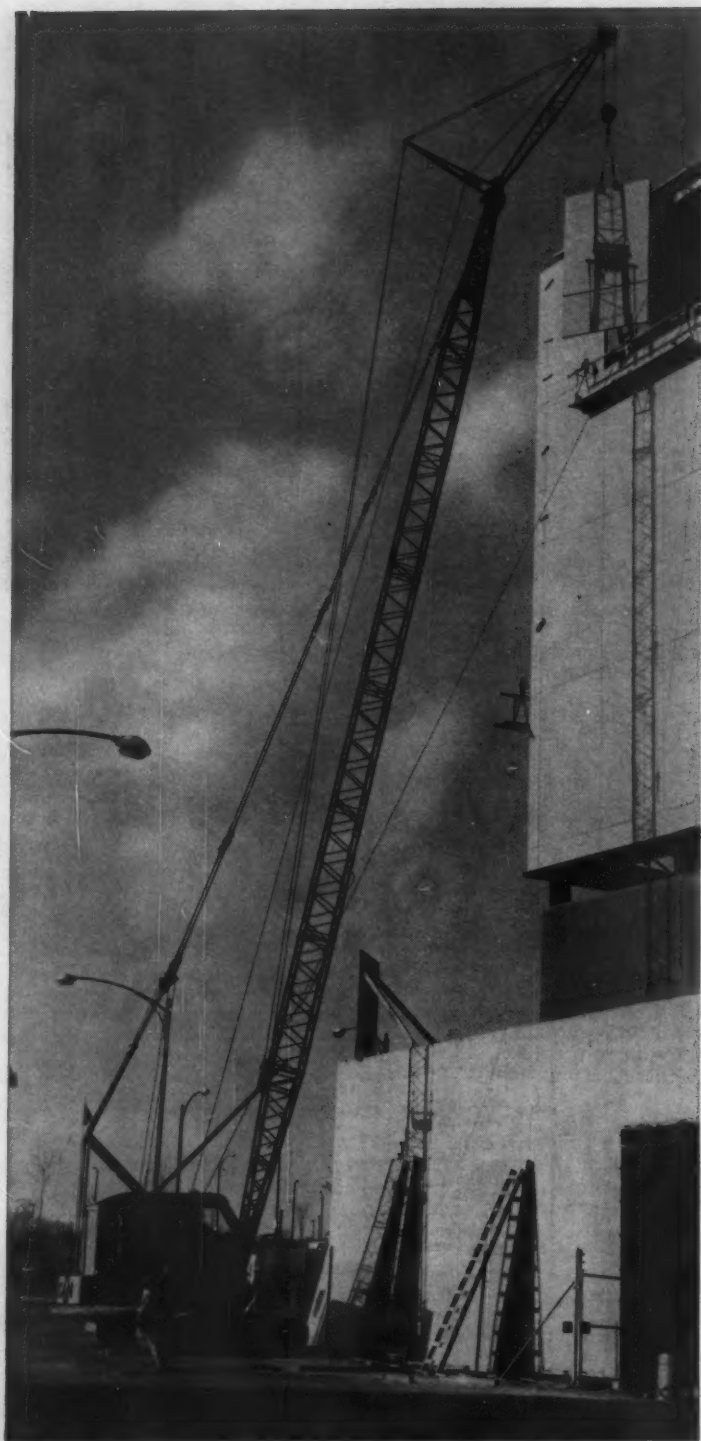
Explosive	Heaving Energy Ft. Tons/Lb.	Shattering Energy Ft. Tons/Lb.	Effective Energy Ft. Tons/Lb.	Useful Energy Ft. Tons/\$
Spencer N-IV and Fuel Oil	423	60	483	14,230
40% Gelatin Dynamite	257	115	372	1,770
60% Gelatin Dynamite	384	84	468	1,800



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Without cost or obligation, please send me the latest information on the use of Spencer N-IV and fuel oil for blasting.

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Firm
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setting 3½-ton marble slabs... 100 ft. up

On this ticklish facing assignment, 7000 lb. polished marble slabs had to be spotted with velvet-glove precision . . . or else! Any jarring or fading as slabs were inched into position could mean chipping and costly replacement.

An AMERICAN 300 Series crane handled the entire job without damaging a single slab! The operator — who took phoned instructions from riggers on top of the building — deserves a pat on the back for a job well done. But he gives a lot of the credit to AMERICAN's smooth controls and overall operating stability. He sums it up by saying, "It's the *best* machine I've ever been on."

On *every* AMERICAN, you get the operating advantages of (1) precise control, with smooth-running anti-friction bearings on *all* constantly turning shafts, even on the brake linkages, (2) over-size, cool-running brakes and clutches, (3) exclusive sprag-type overrunning boom-hoist that gives instant, jerk-free control of boom lowering.

If you want a crane that can work profitably on *any* job, tough or routine, get up-to-date facts on AMERICAN.

CC-701

EXCAVATORS
½ to 4½ yds.

CRANES
12½ to 110 tons

DERRICKS-HOISTS
to 800 tons

REVOLVER CRANES
to 400 tons

FORGED FITTINGS
FOR WIRE ROPE
AND CHAIN

(Crosby-Laughlin Div.)



AMERICAN HOIST
and DERRICK COMPANY
ST. PAUL 7, MINNESOTA

Circle 196 on Reader Service Card

CONSTRUCTION METHODS

NEW PRODUCT BRIEFS

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.

CURING AGENT and seal, Tremcrete, is applied to new concrete floors 10 to 12 hr after final troweling. It dries in 2 to 3 hr and provides a high degree of water retention.—Tremco.

Circle 415 on Reader Service Card

ELECTRIC CORD REEL retracts automatically into its housing, eliminating kinking and knotting. Models of Droplight Reels are available with from 20 to 30 ft of neoprene cord.—Cordomatic.

Circle 416 on Reader Service Card

CAR DOOR PULLER has 3,000-lb capacity when used with double lines. Models are offered with either 20 or 30 ft of steel cable. The smaller unit weighs 10 lb, the larger 13 lb.—Beebe Bros.

Circle 417 on Reader Service Card

HAMMER DRIVE TOOL, the HD-100, sets Nelson headed and threaded drive studs in concrete, masonry, and light-gage steel without drilling, filling, or plugging.—Gregory.

Circle 418 on Reader Service Card

TWO-WAY RADIO, the Pacer, mounts under the dash and has 15 tubes and two transistors. For operation in low band (27-50 mc) and high band (150-174 mc), the 15-w unit sells for \$419.—G. E.

Circle 419 on Reader Service Card

VIBRATING SCREENS are fully enclosed for use in hot-mix asphalt plants and quarrying and cement operations with dusty conditions. Steel enclosure panels are held in place by swing bolts.—Deister.

Circle 420 on Reader Service Card

BACKHOES, the 260-H and 360-H, are adaptable to any make tractor. The 260-H is designed for use with light or medium tractors and the 360-H is suitable with medium or heavy machines.—Pippin.

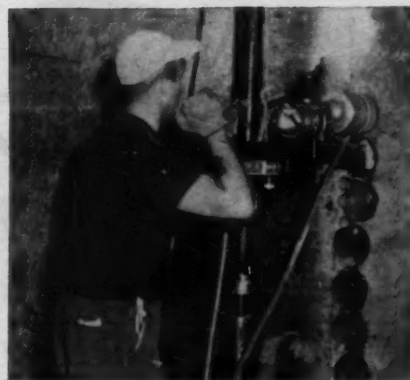
Circle 421 on Reader Service Card

FORM SCALER and release agent for concrete is shipped as a slurry that mixes readily in cold water. Compound C contains a surface active agent for uniform coating on concrete forms.—Shell.

Circle 422 on Reader Service Card

CUTTING POWER!

Holes From
Floor to Ceiling
With One Setup
of Longyear
"330" Drill!



For more facts on application of Longyear drills and diamond bits, write Department 5B.

A midwest contractor had to make two 6 x 7 foot openings through a 13-inch thick concrete wall. Their air hammer stopped every time it hit reinforcing. Finally they tried a Longyear

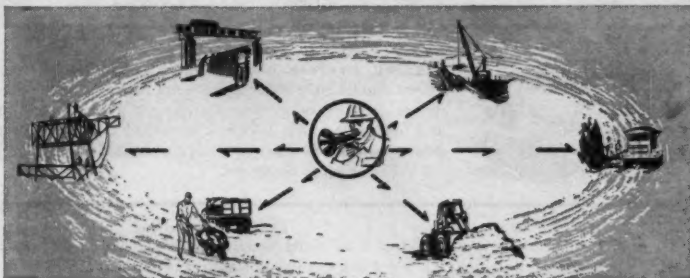
"330" drill and 6-inch diamond bits. With one setup of the "330" they cut a line of holes from floor to ceiling, 3/4-inch reinforcing and all! No scaffolding needed.



E. J. LONGYEAR CO.

76 S. Eighth Street, Minneapolis 2, Minnesota
Phone: FEderal 9-7631

Circle 197 on Reader Service Card



PROJECT YOUR ORDERS...
LIKE A HARPOON... OVER A HALF-MILE RANGE

MAKE 'em hear you... without screaming your head off! Just speak in a normal voice, and let your Audio Hailer project your words... anywhere within a half-mile radius.

New "TP" (transistor-powered) Hailer runs on ordinary flashlight cells, weighs only 5 1/4 lbs. complete, has no external connections whatever, and far outperforms any other type of portable voice equipment.

Save your voice... your time... your temper! Mail coupon for full description and price list.



AUDIO EQUIPMENT CO., INC.
P.O. Box 192, Fort Washington 39, N. Y.
RUSH Audio "TP" Hailer catalog and prices.

Name _____ Title _____
Company _____
St. & No. _____
City _____
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(If any) State _____

AUDIO
HAILER
transistor-powered
PORTABLE MEGAPHONE

Circle 306 on Reader Service Card

NOW—with the

Scout®

**ONLY INTERNATIONAL offers you
such a wide range of
all-wheel-drive trucks**

From this tough little all-weather handyman to giants with 73,000 lb. GVW rating, INTERNATIONAL gives you today's most complete construction team! And INTERNATIONAL is in a class by itself for keeping you on schedule, too. A vast, nation-wide network of sales and service centers, plus 12 major parts depots, *makes sure of it.* Look at this line-up:



Always on the job: INTERNATIONAL model C-120(4x4) takes you in before the roads are in! GVW rating up to 7,000 lbs. This powerhouse has all-wheel bite and the famous INTERNATIONAL V-8 engine (6-cylinder and another V-8 model optional). Big 8½-foot box lets you bring along the whole construction shack on the first trip. Eight and 9-foot platform and stake bodies optional.



Grading, hauling, backfilling or blade-work: Versatile INTERNATIONAL model BC-180(4x4) can work any part of the job. This compact-design truck maneuvers easily in tight working conditions. Both front and rear have power take-offs to deliver INTERNATIONAL's full V-8 authority where you want it. Gasoline or LPG 6-cylinder engine optional, GVW rating up to 20,000 lbs.



Moving a 10-yard load of rock: Rugged INTERNATIONAL model RF-190(6x6) has the power and traction to do it—out from under the shovel and back on the road without bogging down. It will perform under the most foul weather conditions. Six-cylinder engines up to 212 hp., GVW rating up to 43,000 lbs.



Transit-mix with traction to spare: A bear for work off the road, the INTERNATIONAL model RF-210(6x6) chassis will take that transit-mix load anywhere. Rated up to 52,000 lbs. GVW, now it offers you all the advantages of new INTERNATIONAL live-tandem bogie. Six-cylinder engines up to 212 hp., power steering optional.

Need a dump truck right away? INTERNATIONAL will have one ready in 24 hours! Six-wheeler or single axle, your nearby INTERNATIONAL Truck Dealer or Branch can ship you

the truck you select from their special Truck Sales Processing Center. It's one more example of the service INTERNATIONAL provides, to keep your job on schedule.

INTERNATIONAL® TRUCKS

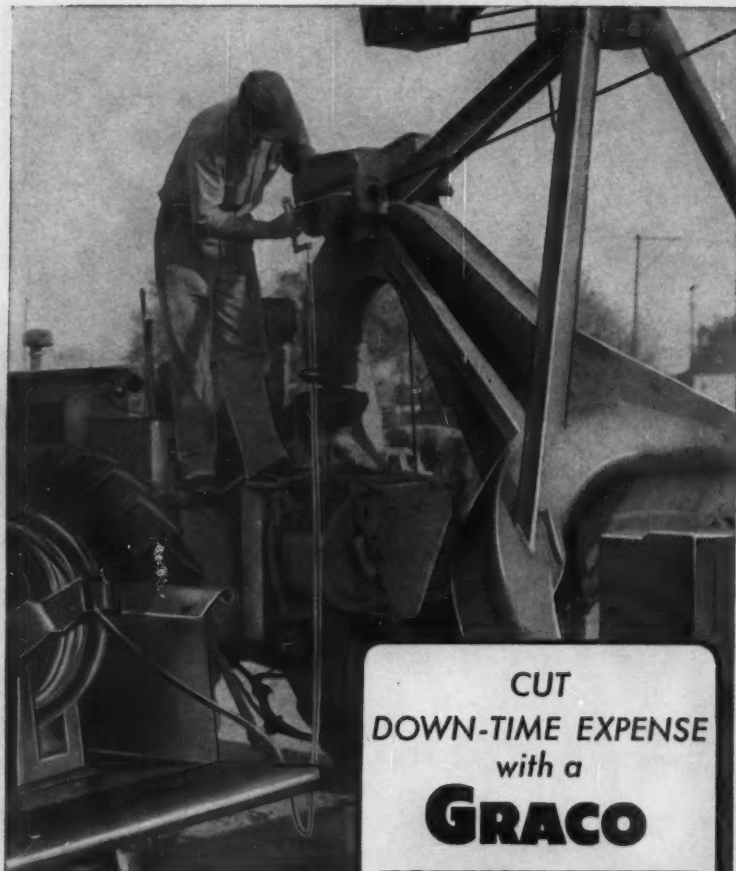
WORLD'S MOST COMPLETE LINE

Motor Trucks • Crawler Tractors • Construction Equipment • International Harvester Company, Chicago
McCormick® Farm Equipment and Farmall® Tractors

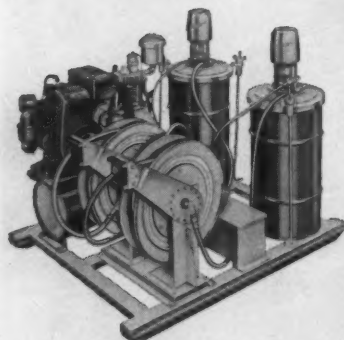




Off-road workhorse, hardtop pickup... you can count on the new, low-cost Scout to whip you out to the job site and back comfortably, economically. The Scout carries three men in the enclosed all-steel cab, hauls hefty loads in the 5-foot box. It strips down for even faster action, too—roof, doors and windows are removable in minutes, windshield folds down. Powered by tough, new INTERNATIONAL 4-cylinder COMANCHE engine to save you gas. Ask your SCOUT Dealer for full details now.



CUT
DOWN-TIME EXPENSE
with a
GRACO
CONVOY LUBER



FREE! Graco Idea Book describes and illustrates typical equipment arrangements, gives specifications, explains how to "job plan" your lube truck. Send for your copy today!

Every minute you spend maintaining your equipment costs you money! That's why it will pay you to investigate a Graco Convoy Luber.

Designed for on-the-spot lubrication . . . these lubers work to provide fast greasing, oiling and air service in the field.

You pump lubricants direct from original shipping drums . . . save equipment transportation time . . . cut costly breakdowns drastically by maintaining around-the-clock lubrication service.

With Graco on the job, preventative maintenance can be fast and systematic . . . and scheduled lubrication of equipment means longer equipment life, less down-time.

Graco Convoy Lubers are available in many sizes and any combination of reels, pumps, compressors, or hoses. See your Graco dealer today for more details on the combination to meet your job requirements.

GRACO
ENGINEERS AND MANUFACTURERS

GRAY COMPANY, INC.

446 Graco Square
Minneapolis 13, Minnesota

See Photo Book Yellow Pages Lubricating Equipment For Graco Suppliers

Circle 200 on Reader Service Card

NEW PRODUCT BRIEFS . . .

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.

CONCRETE VIBRATORS eliminate eccentric weights in the heads, enabling flexible shafts to run at slow speeds while high-frequency vibrations develop in the heads. —The Prime-Mover Co.

Circle 423 on Reader Service Card

BITUMINOUS DISTRIBUTOR, FX-500, has been added to Etnyre's line. This Blacktopper has a 400-gpm pump that is heated by engine exhaust directed into the case surrounding the impeller. —Etnyre.

Circle 424 on Reader Service Card

RIVET KIT contains each of 10 POP rivet sizes for fastening work. The high-strength, hollow rivets are assembled on a solid mandrel. Price: \$57.50. —Shelton Div. of United Shoe Machinery Corp.

Circle 425 on Reader Service Card

HYDRAULIC PUMPING UNIT is equipped with a 3-hp gasoline engine. The Vanguard, No. Y26-G, operates at pressures up to 10,000 psi. Weight: 78 lb. —Precision Hydraulics Div. of Owatonna Tool.

Circle 426 on Reader Service Card

PORTABLE POWER DRILLS automatically adjust drilling speed when in use. The Duo-Drill's loaded speed in metal for 1/4-in. bit is 1,500 rpm, for 3/8-in. bit is 1,050 rpm. —John Oster Mfg.

Circle 427 on Reader Service Card

PUMPS are now equipped with semi-pneumatic type of puncture-proof tires to withstand shock and cushion vibrations. Each wheel on Models 8M, 10M, and 33DL can carry 200 lb. —McGowan.

Circle 428 on Reader Service Card

WATER SUCTION HOSE is for use where hose is subject to damage by trucks. The Rebound's shape is maintained by a rope helix embedded in rubber between fabric reinforcement. —Goodyear.

Circle 429 on Reader Service Card

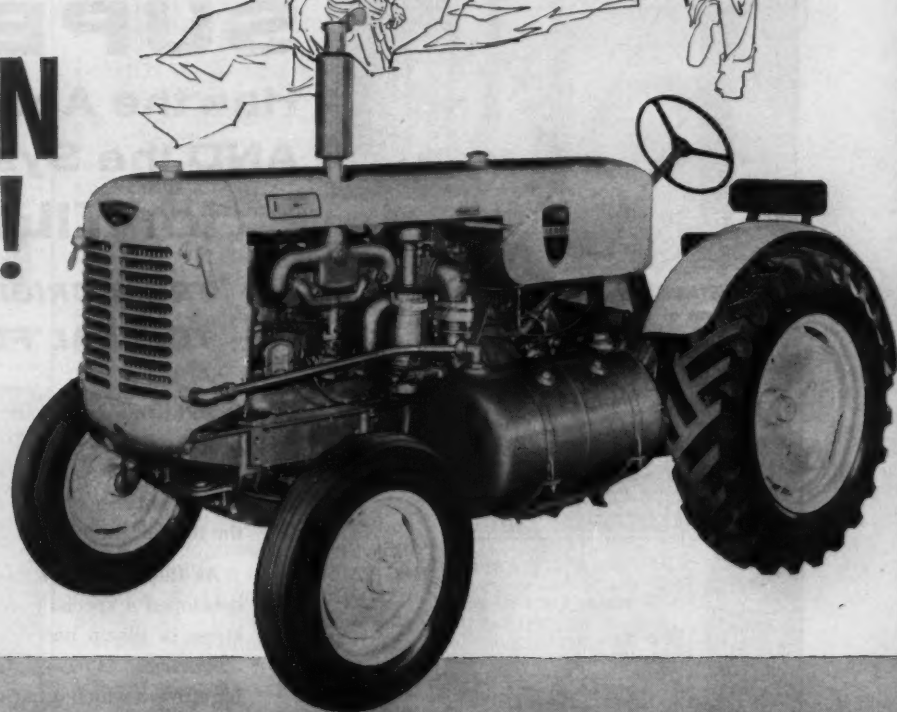
AIR HOSE made of double-braided high tensile rayon can maintain pressure up to 400 psi. The Maxi-mair is available in 25, 50, and up to 75-ft lengths through 2-in. sizes. —Dayco.

Circle 430 on Reader Service Card

Circle 201 on Reader Service Card ➔

CONSTRUCTION METHODS

BRINGS COMPRESSED AIR ANYWHERE UNDER ITS OWN POWER!



Here's a self-propelled air compressor that eliminates *all* the dead time spent by conventional compressors waiting to be towed somewhere!

The Tractair is a 42-hp tractor and a 125-cfm air compressor. It brings air power to sites you'd fear to tread with truck-towed compressors. You can park it in a ditch or on a steep slope, attach the hose, and start drilling. When finished, the operator drives it to the next job — without waiting for a tow truck or men to jockey it into position. You can drive up close to the work, too, which means shorter hose... less hose damage... and full 125 cfm power at the tool.

The improved Tractair offers greater efficiency and fuel economy. It's designed for operator convenience... all-weather dependability... and the easiest servicing in the field. Add available attachments and you have a money-saving self-propelled air-plant for year-around construction and maintenance work.

Ask your Le Roi distributor for a free demonstration. Or write to Le Roi Division, Westinghouse Air Brake Co., Sidney, Ohio.

LE ROI
TRACTAIR®
AIR COMPRESSORS



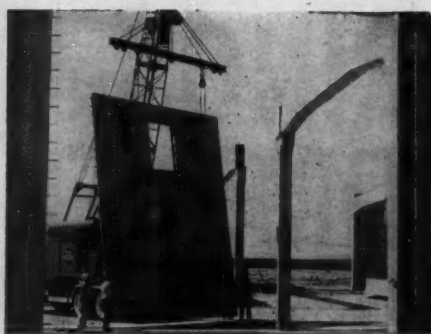
T-01

PORTABLE AND TRACTAIR® AIR COMPRESSORS • STATIONARY AIR COMPRESSORS • AIR TOOLS

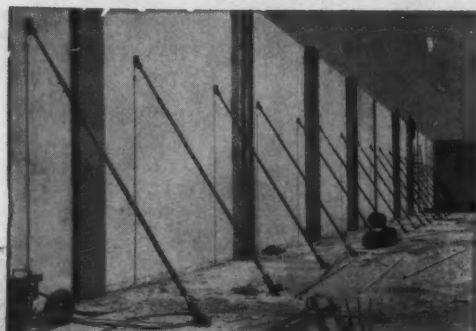


WAREHOUSE

DANIEL CONSTRUCTION CO. PHOTO



SUPERIOR Stress Equalizers, Pick-Up Inserts, and Lifting Angles were used on this panel.



ADJUSTABLE BRACES used for quick and easy alignment of panels

DANIEL CONSTRUCTION CO. PHOTO

SUPERIOR

Has the Accessories AND the System for TILT-UPS ...

**FROM ORIGINAL LAYOUTS
TO FINAL POSITIONING**

In addition to tilt-up accessories which have been used and proven on thousands of conventional as well as unusual projects in this field, SUPERIOR also provides the *system* for the entire job, from original planning and layouts, to the final positioning of the precast panels.

As the pioneer in this field, SUPERIOR has recently developed a special Stress Equalizer for reducing lifting stress in tilt-up panels of over 20 ft. high. It offers two advantages: (1) Less concrete reinforcing steel is required for stresses which occur at time of lift; (2) Permits use of simplified crane rigging.

On your next tilt-up job, avoid expensive crane delays, be assured of safety, and reduce overall costs! Specify the SUPERIOR System.

For details request a copy of Bulletin TU-4.

SUPERIOR

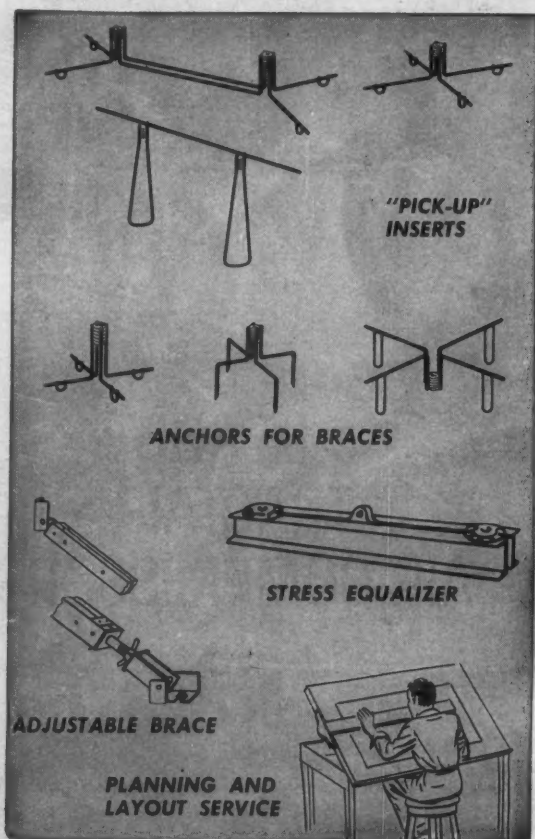
CONCRETE ACCESSORIES, INC.

9301 King St., Franklin Park, Ill. (Suburb of Chicago)

Pacific Coast Division Office and Factory:
2100 Williams Street, San Leandro, Calif.

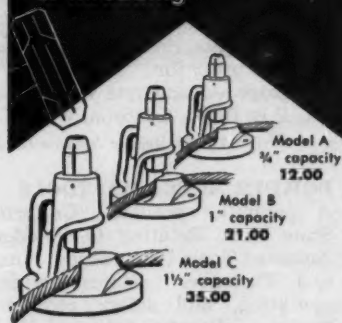
New York Office:
39-01 Main St., Flushing 54, New York

Houston Office:
4101 San Jacinto, Houston 4, Texas



Circle 202 on Reader Service Card

WITH A
HAMMERBLOW...
3 SHARP RAPS
CUT WIRE ROPE
CLEAN...leave it
round, ready for splicing
or threading



Write for name of your
nearest stocking distributor

HAMMERBLOW
WIRE ROPE CUTTER CO.

19 Profit Ave. • Springfield, N. J. • DRexel 6-4767

Circle 307 on Reader Service Card

when you repower
big machinery...



- input torque 150 to 2500 ft-lb
- standard or engineered to order
- low-cost production, whether quantity is 1 or 100
- all gears alloy steel—heat-treated
- all shafts mounted on ball or roller bearings, precision aligned



COTTA
TRANSMISSION CO.
ROCKFORD, ILLINOIS

Circle 308 on Reader Service Card

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy of the items you want, circle the appropriate numbers on the READER SERVICE CARD just inside the back cover.

BITUMINOUS DISTRIBUTORS

—An 8-p. catalog covers bituminous distributors and explains the Rosco pressure metering method of applying bituminous materials.—Rosco Mfg. Co., 3128 Snelling Ave. South, Minneapolis 2, Minn.

Circle 431 on Reader Service Card

GROUTING — Text and photographs in Bulletin EMPG-2a explain the proper methods for grouting different types of heavy industrial equipment. This 7-p. publication discusses the mixing and placing of Embeco pre-mixed grout.—The Master Builders Co., Cleveland 18, Ohio.

Circle 432 on Reader Service Card

HOLDBACK CLUTCHES—A 12-p. catalog details Formsprag's clutches that prevent runback of inclined conveyors, bucket elevators, and related material handling equipment.—Formsprag Co., 23601 Hoover Rd., Warren, Mich.

Circle 433 on Reader Service Card

CRANES—The 40 basic models of P&H power cranes and shovels are covered in a catalog. The line consists of 17 crawler-mounted excavators, 11 truck cranes, nine electric excavators, and three special crawler erecting cranes. Nine of the basic excavator models can also be used as crawler cranes.—Harnischfeger Corp., 444 W. National, Milwaukee, Wis.

Circle 434 on Reader Service Card

MOTORIZED WHEEL—Bulletin GED-4261 describes the motorized wheel drive developed for off-highway equipment. The publication contains photographs of a working earth-hauling vehicle. It supersedes a previous bulletin on the motorized wheel.—General Electric Co., Schenectady 5, N.Y.

Circle 435 on Reader Service Card

BORING EQUIPMENT — The complete line of Ka-Mo earth and rock boring power transmission units, auger sections, and accessories are illustrated in a 12-p.

Circle 436 on Reader Service Card



"THIS LUBRICANT
DOUBLES THE
LIFE OF GEARS"

—says TRINITY ALPS LUMBER CO.
Hayfork, California

"Our trucks have a forty mile county road logging haul over adverse grades, each truck making two complete round trips each working day. Our shop foreman in charge of maintenance, reports that with the use of LUBRIPLATE Lubricants there has been a minimum of truck down time and replacements of bearings and gears. The double reduction gears with LUBRIPLATE APG-140 has shown a saving of fifty per cent over previous operations."

**REGARDLESS OF THE SIZE AND
TYPE OF YOUR MACHINERY,
LUBRIPLATE GREASE AND
FLUID TYPE LUBRICANTS WILL
IMPROVE ITS OPERATION AND
REDUCE MAINTENANCE COSTS.**

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.



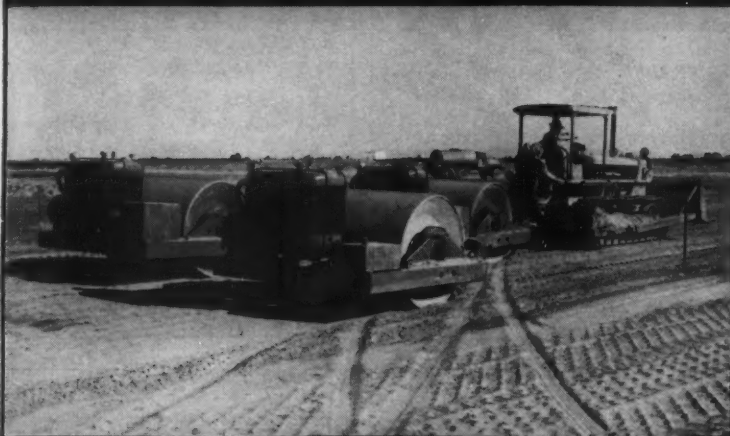
For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



Circle 203 on Reader Service Card

ESSICK

VIBRATING COMPACTORS



Essick VR-72 Triplex Unit on Yuma Marine Auxiliary Air Station Job

COSTS CUT 2¢ PER YARD ON 1,000,000 CUBIC YARDS

SUNDT AND BEVANDA INCREASE COMPACTION PRODUCTION FROM 13,000 TO 18,000 CUBIC YARDS PER DAY

N. Pat Richardson, Project Manager for M. M. Sundt Construction Co. and M. J. Bevanda Co., Inc. of Yuma, Arizona writes:

"You will be interested to know that we were very impressed with the performance of our Essick VR-72 Vibrating Compactors on our recently completed Yuma Marine Auxiliary Air Station job. As you know, we used three VR-72's in a triplex hook-up which compacted a pattern of sandy silt 17-feet 8-inches wide. The job, under the jurisdiction of the 11th Naval District, called for 13,300' of Runway 200' in width, and 17,500' of taxiway 75' in width.

The one triplex unit of Essick VR-72's, along with 3 pushers and 10 scrapers allowed us to load, spread, and compact up to 18 thousand cubic yards in an 8 hour shift. We originally used other methods of compaction but the one Essick VR-72 Triplex Unit increased our production from 13,000 yards to 18,000 cubic yards per 8 hour day, and our compaction costs were reduced approximately 2¢ per cubic yard.

The material was a sandy silt with an average plastic index of 6. We put down in excess of 1,000,000 cubic yards on the complete job and in our opinion, the performance of the Essick VR-72's gave us a more successful and profitable job with greater production and lower costs."

For either low or high plastic index soils, there is an Essick Vibrating Compactor designed to produce greater compaction, at less cost for any compaction requirement.



9 Models of Vibrating Compactors from 13" to 72" widths

Also 14 Models of Tandem Rollers from ½ to 14 Tons

ESSICK MANUFACTURING COMPANY

1950 SANTA FE AVENUE
LOS ANGELES 21, CALIFORNIA

850 WOODRUFF LANE
ELIZABETH, NEW JERSEY

Affiliated with THE T. L. SMITH CO., Milwaukee, Wisconsin

Circle 204 on Reader Service Card

NEW PUBLICATIONS...

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.

brochure.—Kwik Mix Co., Ka-Mo Tools Dept., Port Washington, Wis.

Circle 437 on Reader Service Card

WIRE ROPE—Bulletin No. 5702-R, "Correct Wire Rope for Contractors' Equipment," details the specific uses for "7-Flex (R)" wire rope.—Macwhyte Wire Rope Co., P.R. Dept., Kenosha, Wis.

Circle 438 on Reader Service Card

POWDER ACTUATED TOOLS—A pamphlet entitled "Uniform State Code Relating to Powder Actuated Tools Using Studs, Pins, and Fasteners" relates design, operating, and safety requirements.—Powder Actuated Tool Manufacturers' Institute, 200 College St., New Haven, Conn.

Circle 439 on Reader Service Card

INSTRUMENTS—A brochure describes basic builders' instruments and accessory items, including transit levels, leveling rods, steel tapes, plumb bobs, and hand levels.—Keuffel & Esser Co., Third and Adams Streets, Hoboken, N.J.

Circle 440 on Reader Service Card

EXCAVATOR—Catalog No. 200-3A provides dimensions, specs, working ranges, and capacities of the Insley WT 1-yd excavator with backhoe, crane, clamshell, dragline, and shovel attachments.—Insley Mfg. Corp., P.O. Box 167, Indianapolis 6, Ind.

Circle 441 on Reader Service Card

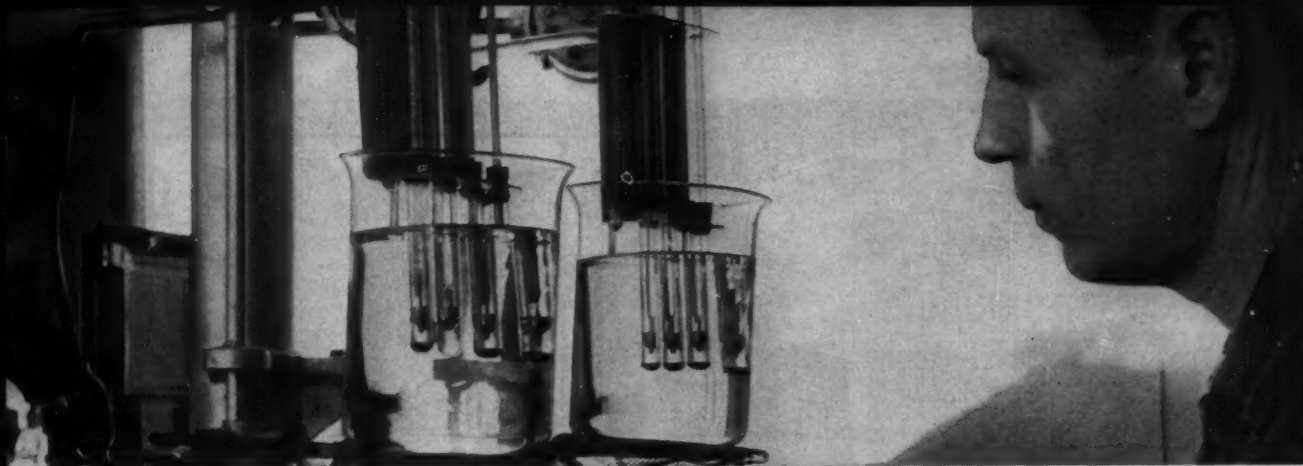
DREDGES—The latest advances in portable hydraulic pipeline dredges are discussed in a 16-p. bulletin, No. 980. Illustrations show the Dragon models in operation on a variety of projects throughout the world.—Ellicott Machine Corp., Dept. A, 1611 Bush St., Baltimore, Md.

Circle 442 on Reader Service Card

TOWER CRANE—A 4-p. bulletin describes the Mark I-50 tower crane, designed to handle crane applications with a reduction in labor and materials handling costs.—Bucyrus-Erie Co., S. Milwaukee, Wis.

Circle 443 on Reader Service Card

CONSTRUCTION METHODS



Dropping point test shows how greases react to heat. Beaker fluid has been heated to 390° F. All greases tested except Darina (second tube from left) have passed from solid to liquid state.

BULLETIN:

Shell reveals the remarkable new component in Darina Grease AX that helps it last up to 3 times longer than soap-base greases

Darina® Grease AX is made with Microgel®, the new thickening agent developed by Shell Research.

Severely tested for 18 months, Darina AX with Microgel proved its ability to resist washout, even in mud and slush—stay smooth and buttery at high temperatures—and reduce maintenance.

Read how this superior new multi-purpose grease can help solve your lubricating problems.

THERE IS no soap in Darina Grease AX. No soap to melt away—wash away—or dissolve away.

Instead of soap, Darina AX uses Microgel—a development of Shell Research.

What Microgel does

Because of Microgel, Darina AX has no melting point. It won't run out of bearings.

Even compared to soap-base greases, Darina AX provides significantly greater protection under adverse service conditions.

Resists washout

Mix water into Darina AX and the grease maintains its consistency. It

shrugs off water—won't emulsify. For fleets that must operate in snow, slush, rain or mud—Darina AX is an ideal choice.

Longer lubrication life

Shell scientists tested Darina AX, under wet conditions, in a special device called an Oscillating Friction Machine.

Darina AX kept its lubricating qualities twice as long as a premium soda soap-base grease; 2½ times longer than a calcium-soap grease; 3 times longer than an aluminum-soap grease.

Results of field test

In a recent field test, 15 firms used
Circle 205 on Reader Service Card

Darina AX in chassis and wheel bearings of over 1000 vehicles. These buses, trucks and vans rolled up 30,097,000 chassis miles. The results:

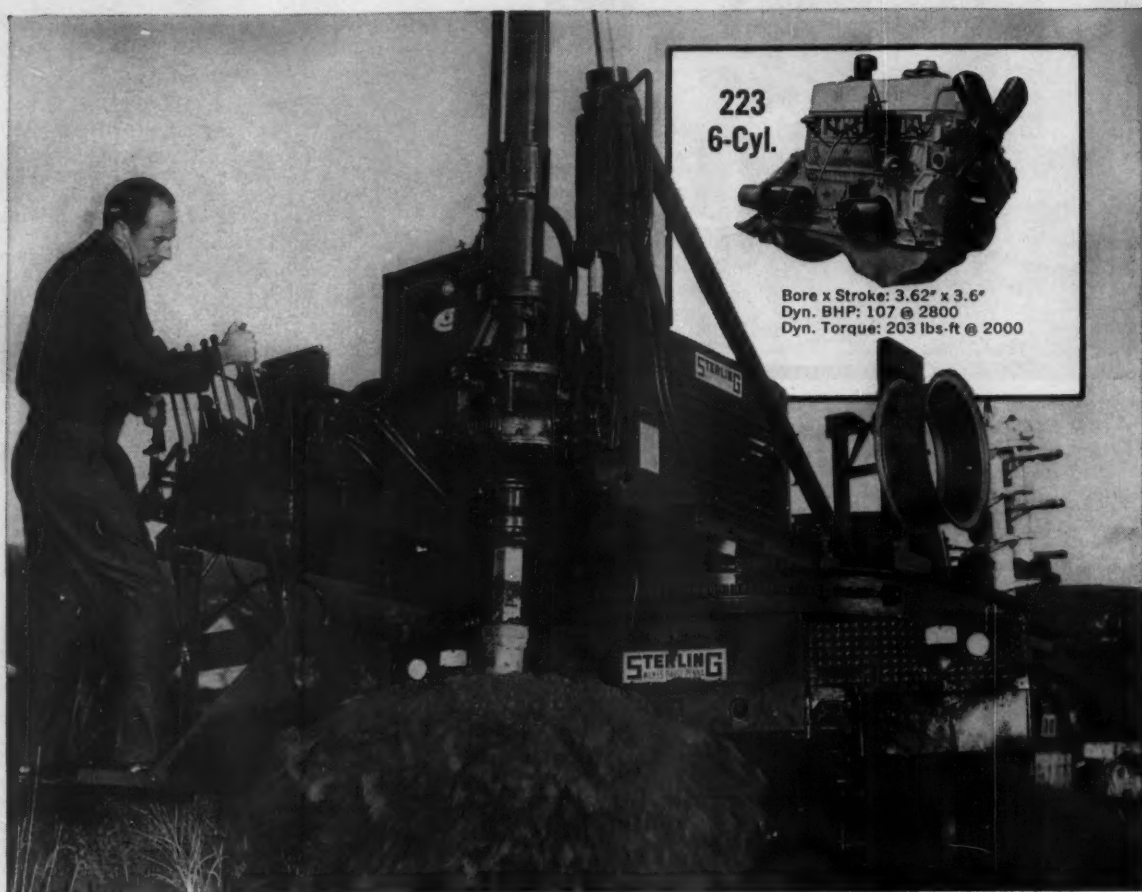
1. Every company was pleased with the performance of Darina AX.
2. There wasn't one wheel bearing failure due to grease deficiency.
3. In many cases, re-lubrication schedules could be extended.

For details, see your Shell Representative. Or write: Shell Oil Company, 50 W. 50th St., N. Y. 20, N. Y.

*Registered Trademark



A BULLETIN FROM SHELL
—where 1,997 scientists are helping to provide better products for industry



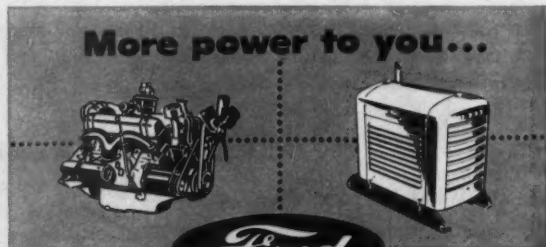
WHY THE RUGGED STERLING EARTH BORING MACHINE IS POWERED BY A FORD INDUSTRIAL ENGINE . . .

Sterling Engineering & Manufacturing Company uses the dependable Ford 223 6-cylinder Industrial Engine in its earth boring machines, because at low rpm's, this engine easily delivers the high torque needed for tough digging operations. The rugged, yet precision-engineered features of Sterling Diggers have won for them world-wide acceptance by telephone and power companies, electric and pole line contractors, and road and guard rail contractors. According to Sterling . . . "Where digging is the hardest, Ford Industrial Engines pay off as power performers where performance really counts!

"Ford engines' low maintenance, economical operation, and ready availability of parts are a major factor in Sterling Diggers' universal glowing performance reports." And no wonder, for Ford Parts availability means a minimum of downtime for Sterling's customers.

More OEM's than ever before are swinging to Ford, because *only* Ford offers a full line of modern, overhead-valve-design engines to meet every power requirement. And they're *compact* . . . delivering more horsepower per pound of engine weight than ever before possible. Ruggedly built, too . . . for longer engine life and more reliable operation.

Low-priced, quality-controlled Ford Parts are as near as your Ford Dealer. You get red-carpet service *when* it's needed! Most engines are available as foot- or skid-mounted power units . . . open or closed models. Call or see us today!



Ford
INDUSTRIAL ENGINES
AND POWER UNITS

**FORD POWER IS RIGHT FOR
YOUR EQUIPMENT, TOO!**

INDUSTRIAL ENGINE DEPARTMENT, FORD DIVISION, FORD MOTOR CO., P.O. BOX 598, DEARBORN, MICH.

West of Rockies write to:

→ FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 6787, LOS ANGELES 22, CALIF.
→ FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 1666, RICHMOND, CALIF.

SHORT CUT TO LONG LINES



Save Work and Speed the Job with NAYLOR Pipe and Wedgelock Couplings

For air, water and ventilating lines, you'll save time and money with this NAYLOR combination.

NAYLOR pipe is light in weight, easy to handle and install. Its lock-seamed, spiralwelded structure assures extra strength and safety.



WEDGELOCK couplings provide a positive connection securely anchored in standard weight grooved ends. Speed the job. A hammer is the only tool required to connect or disconnect them. Available in low-pressure and heavy-duty types.

Write for Bulletin No. 59 on pipe, fittings and couplings.



**NAYLOR
PIPE Company**
General Offices and Plant
1267 East 92nd Street, Chicago 19, Illinois
Eastern U. S. and Foreign Sales Office
60 East 42nd Street, New York 17, N. Y.
Circle 309 on Reader Service Card

APRIL, 1961

NEW PUBLICATIONS...

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.

CABLEWAY MACHINES—Catalog C shows how digging slack-line cableways are used to recover sand and gravel deposits and to excavate and haul bulk materials. A table indicates capacities of each size machine at varying haul distances.—Sauerman Bros., Inc., 612 S. 28th Ave., Bellwood, Ill.

Circle 444 on Reader Service Card

FORK LIFTS—Specifications on the world's largest general purpose fork trucks are given in an 8-p. bulletin, No. SS-2045. The two trucks described, the Ranger 600 and 700, have capacities of 60,000 and 70,000 lb. at 48-in. load centers.—Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.

Circle 445 on Reader Service Card

SOIL SAMPLERS—Bulletin 300-1 deals with the recent changes in Sprague & Henwood's line of soil sampling equipment. Changes to existing samplers include the modification of all barrel samplers to permit the insertion of brass or plastic liners—Sprague & Henwood, Inc., Scranton 2, Pa.

Circle 446 on Reader Service Card

CONCRETE PAVER—The Tribatch is featured in "Pave Your Way to Profits." The world's largest concrete paver, the Tribatch has a three-compartment mixing drum, pressure injection water system, and electric batchmeter.—Koehring Div., Koehring Co., Milwaukee, Wis.

Circle 447 on Reader Service Card

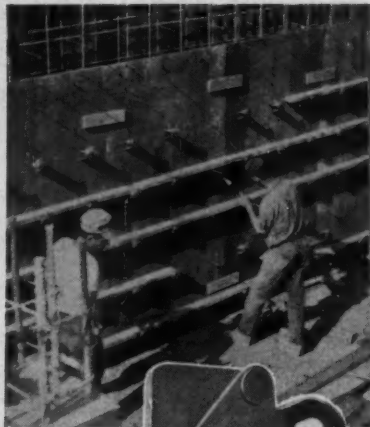
PNEUMATIC BLOWERS—Bulletin 160 gives performance curves and technical information on two new CycloBlowers for pneumatic unloading of bulk trailers. These blowers provide air discharge pressure up to 16 psig in continuous operation, up to 20 psig on intermittent operation.—CycloBlower Co., York, Pa.

Circle 448 on Reader Service Card

TRACTORS—IH's complete line of industrial tractors and equipment is pictured in a 20-p. catalog. Displayed are nine tractors, ranging from the 14-hp Cub Lo-

Cut Forming Costs

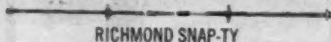
with **Richmond's**
Jahn Bracket System



JAHN WALER
BRACKET—TYPE A
(Also Type B; without
eccentric for use with T-headers)

Richmond's new "Jahn" Concrete Forming System, for foundation and wall construction, is designed to save time and money. It will reduce labor costs at least 30% and material costs up to 80%.

- Provides rapid, simple erection and removal of forms.
- Eliminates form framing materials—only loose plywood sheets and single horizontal walers needed.
- Reduces costly multiple accessory parts—only one-piece Jahn Waler Bracket used with Richmond Snap-Ty.
- Reduces prefabrication and nailing.
- All panels, Walers and Brackets are reusable.



RICHMOND SNAP-TY

For information about this modern method for quick, sturdy, accurate foundation and wall form construction—and help with any specific concreting problem, write to:

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50 YEARS OF PROGRESS



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SALES OFFICES, PLANTS & WAREHOUSES: FT. WORTH, TEX.
ATLANTA, GA. - LAUREL, MD. - ST. JOSEPH, MO. - WALTHAM,
MASS. IN CANADA: ACROW-RICHMOND, ORANGEVILLE, ONT.

Circle 207 on Reader Service Card

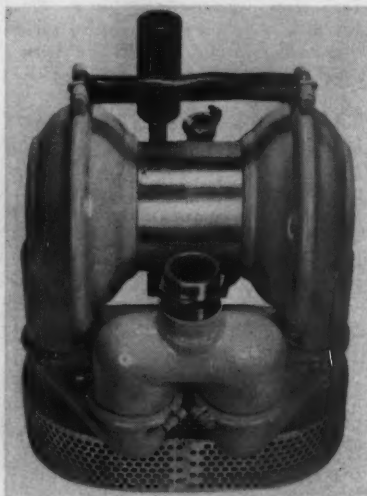
THE LATEST IN DIAPHRAGM PUMPS!

Another new

LAYTON PNEUMATIC PUMP

- Powered by compressed air for more effective, more efficient pumping of liquids containing high percentage of solids or just plain water. Requires just 20 c.f.m. of air at 100 p.s.i. Discharges 6300 g.p.h. at 10 ft. discharge head—2160 g.p.h. at 100 ft.
- Layton pumps are one-man portable... self-priming... quiet in operation... safe... fireproof... odorless. Submerge in liquid or use suction hose.
- The handiest pumps for dewatering trenches, caissons, shafts, foundation holes, tunnel headings, sumps, sludge.

• Distributors in ALL Principal Cities — Write for Catalog or Further Details



• Model DA-4; Weight 79 lbs., Height 21", Length 16 1/4", Width 16 1/4".

LAYTON CO., INC.

P.O. BOX 87A, CUDAHY, WISC.

Phone: HUMBOLDT 1-4400

Circle 208 on Reader Service Card

NEW...IT'S LIKE USING A 10 TON ROLLER

2,500 times per minute, our sensational M 18 Muller Masher hits with a force of 2,700 lbs. equal to a 10 ton roller. Travels up to 75 ft./min. Compacts up to 50 cu. yds./hr., with 6" lifts. Can be used anywhere, anytime.

Write today for free brochure and prices.

MULLER MACHINERY COMPANY, INC.

1 Whitman Ave., Metuchen 19, N. J.
Sales and Service, Nationally.



Circle 310 on Reader Service Card

DURAFORM



The plastic
impregnated
plywood forms
with "BUILT IN"
SPEED for
MORE PROFITS

- ★ One man can set a Duraform panel.
- ★ No loose hardware to handle or lose.
- ★ All panels are reversible for outside or inside walls.
- ★ Duraforms combine framing and bracing in one unit.

For larger profits next season write today for complete information.

DURAFORM, INC.

2903 W. Beltline Hwy., Madison Wisconsin

Circle 311 on Reader Service Card

NEW PUBLICATIONS...

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.

Boy to the 95-hp 669 tractor.—International Harvester Co., Consumer Relations Dept., 180 N. Michigan, Chicago 1, Ill.

Circle 449 on Reader Service Card

CONCRETE EQUIPMENT — A 28-p. catalog depicts Stow's concrete equipment and tampers. Covered are the gasoline-operated concrete vibrators, electric vibrators, 60-cycle motor-in-head vibrators, portable grinders, rotary troweling machines, vibrating screed, and the new T18-A tamper.—Stow Mfg. Co., 31 Shear St., Binghamton, N.Y.

Circle 450 on Reader Service Card

ALLOY CHART—Welding, brazing, and soldering alloys and fluxes are rapidly selected when using this wall chart, measuring 19 1/2 x 25 1/2 in. Each joining alloy is described in detail with recommended pre-heats, amperage or working temperature, tensile or shear strengths, and identification and packaging comments.—All-State Welding Alloys Co., Inc., White Plains, N.Y.

Circle 451 on Reader Service Card

ROLLER—A catalog sheet presents specs on the Air-Pac, a nine-wheeled roller with a 10-ft turning radius and 36-in. rolling width.—Rosco Mfg. Co., 3128 Snelling Ave., Minneapolis 6, Minn.

Circle 452 on Reader Service Card

STABILIZED ROADS—The construction of bituminous stabilized roads is covered in an 8-p. booklet entitled "Sta-Bilt Method Provides Long-Life Roads at Tremendous Saving." It shows how the in-place blending of native materials, aggregate, and emulsion provides low cost, low maintenance roads.—American-Marietta Co., Construction Equipment Div., Milwaukee 1, Wis.

Circle 453 on Reader Service Card

FORMS—Bulletin PSL-130 documents corrosion resistance of Fab-Form, a permanent type for concrete floor and roof slabs.—Pittsburgh Steel Co., Pittsburgh, Pa.

Circle 454 on Reader Service Card

CONSTRUCTION METHODS

Whatever Type You're Looking For... **FRUEHAUF BUILDS IT!**



Complete Platform Line, with units ranging from brawny 50,000-pound capacity workhorse units to lighter-weight multi-purpose and telescoping units. Lengths from 21½ feet for single axle units to 42 feet for tandems.

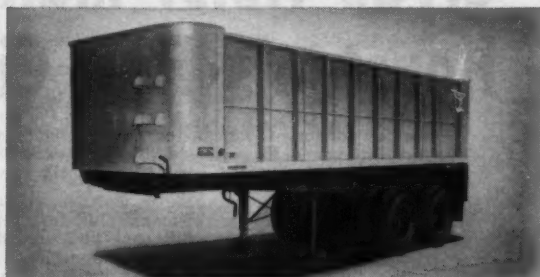
The Industry's Only Complete Line of Rugged Construction Hauling Equipment

In addition to a full line of platforms, carryalls and dumps, Fruehauf offers a wide selection of bulk cement tanks, high temperature insulated tanks, pole trailers, and dump trailer chassis. Fruehauf has the industry's *only* truly nation-wide service facilities for your convenience. Long and short term leasing, too, plus a variety of financing plans to make your purchase of Fruehauf equipment easier.

Why not start today to boost your construction profit dollar. Stop in at your nearest Fruehauf Branch and discuss Fruehauf's complete Trailer package with your Fruehauf salesman.



Complete Carryall Line for over and off-road transport. From 15 to 100-ton rated capacity. Level or drop deck models. Flooring of #1 grade hardwood. Removable goose-neck carryall models cut unloading time to less than 15 minutes!



Complete Dump Trailer Line, from aggregate hopper dumps with up to 30 cubic yard payloads to hoist-type dumps with payloads up to 73 cubic yards! Fruehauf dumps give you greater payloads, faster dumping, lower maintenance costs.



**For Forty-Seven Years—World's
Largest Builder of Truck-Trailers!**

FRUEHAUF TRAILER COMPANY

10949 Harper Avenue • Detroit 32, Michigan

Please send me Fruehauf's complete line folder for 1961.

Name _____ (Please print)

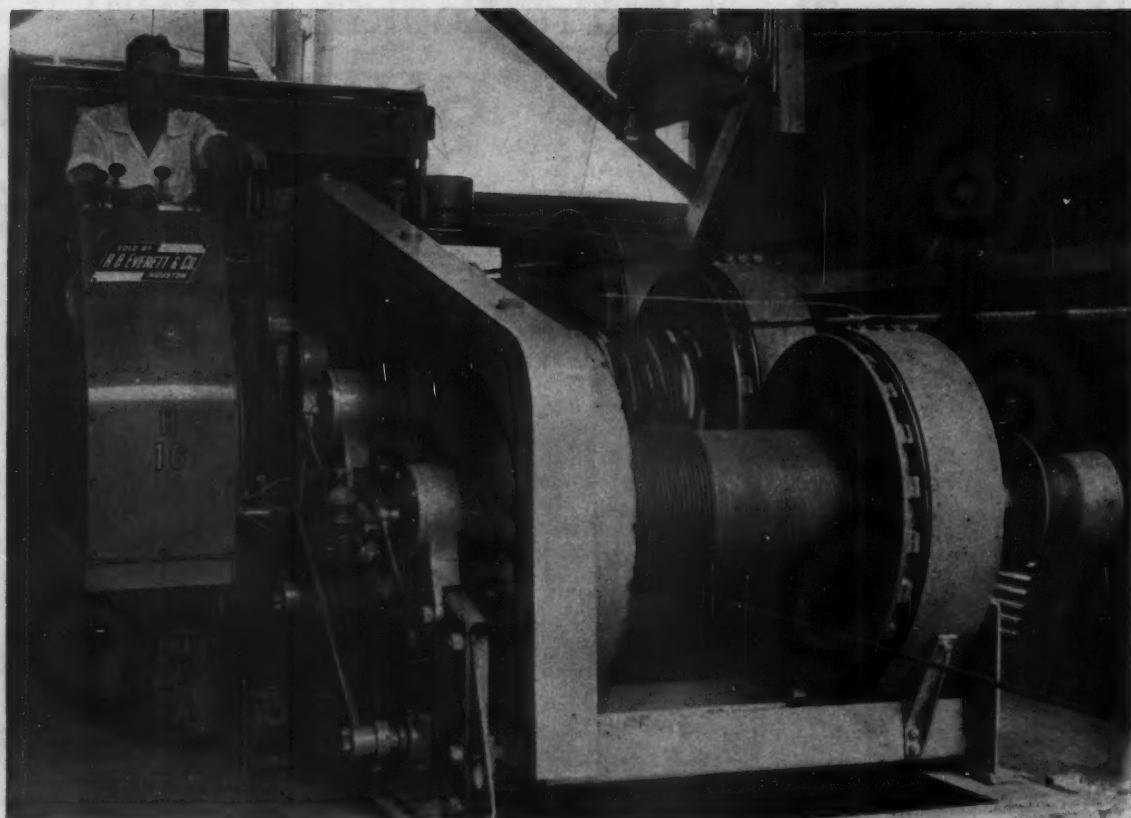
Company _____

Address _____

City _____ State _____



Circle 209 on Reader Service Card



with Safety and Accuracy . . .

Clyde Hoist makes "deposits" at Houston's First City National Bank

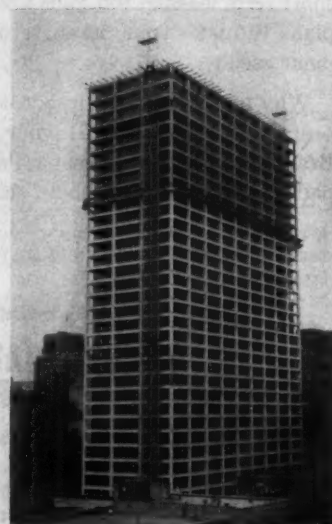
A major portion of the construction materials 'deposited' in the First City National Bank were speedily spotted with this Clyde Frame-6 Hoist . . . hoists noted around the world for dependable, efficient service.

Clyde's reputation is born of many 'plus' features that permit operator to hoist and spot loads with ease and accuracy. Large diameter, extra-capacity brakes handle maximum loads by light toe action. Clyde's internal expanding, band friction clutches give smoother, more positive full-load service.

Comparison of construction features shows why Clyde Hoists have had a reputation for superiority for more than half a century! All steel bed and side frames, high strength spur gears, anti-friction bearings throughout are but a few of the many extra values built into all Clyde Hoists . . . from 3,000 to 80,000 pounds line pull.

There is a Clyde Hoist to fit your requirements . . . to exceed your expectations! Send for Hoist Bulletin 34.

The 32 story First City National Bank adds an impressive landmark to the Houston skyline. Contractor: W. S. Bellows Construction Corp.



CLYDE IRON WORKS, Inc.

Established 1899
DULUTH 1, MINNESOTA

HOISTS : DERRICKS : WHIRLEYS : BUILDERS TOWERS
UNLOADERS : CAR PULLERS : ROLLERS

Circle 210 on Reader Service Card

NEW PUBLICATIONS...

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.

TOWER CRANES—The line of Record tower cranes, manufactured by F. Potain & Co., France, is covered in a 23-p. catalog. The publication includes complete specs, dimensions, weights, erection times, and capacities.—Briere Corp., Bryant Park Bldg., 55 W. 42nd St., New York 36, N.Y.

Circle 455 on Reader Service Card

BORING UNIT—The A295 air-powered boring unit is the subject of a 6-p. bulletin. The machine's boring range varies from 125 ft at 8-in. dia. to 50 ft at 30-in. dia. The A295 has an 18-hp motor, 12.2 to 1 gear reduction, forward and reverse control valve, and an automatic pressure lubricating pump.—Kwik-Mix Co., Div. of Koehring Co., Port Washington, Wis.

Circle 456 on Reader Service Card

ELECTRODE CHART—A 23x35-in. wall chart presents number, color code, description, mechanical properties, size, current range, procedure, and application information on Hobart arc welding electrodes. It also covers welding symbols, causes and cures of common welding troubles, and typical deposition rates.—Hobart Brothers Co., Troy, Ohio.

Circle 457 on Reader Service Card

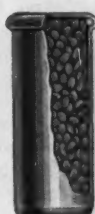
ROCK CRUSHER—The Pulvo-Matic, a new rock crusher with only one moving part, is explained in a 4-p. bulletin. Its cast manganese-steel rotor cage works in conjunction with manganese-steel liner plates to reduce rock products to graded sizes.—The Frog, Switch and Manufacturing Co., P.O. Box 431, Carlisle, Pa.

Circle 458 on Reader Service Card

BONDING CONCRETE—A 32-p. handbook details field application methods for bonding concrete with Thiokol LP/Epoxy adhesives. It covers surface penetration, equipment required, mixing procedures, curing, and the use of solvents in the adhesives. It also contains tables on the effect of temperature on curing time.—International Epoxy Corp., 501 N.E. 33 St., Fort Lauderdale, Fla.

Circle 459 on Reader Service Card

Here's why any powder-actuated tool works better with Remington Loads and Studs



Exclusive "Kleanbore" Priming

22 caliber Power Load (twice actual size)



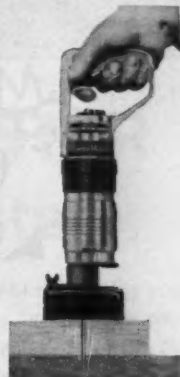
Green "Power-Guide"

1/4" S-25 Stud (twice actual size)

Scientifically graded Remington Power Loads offer precise, uniform charges . . . have strong, non-rusting brass cases. Exclusive "Kleanbore" priming mixture protects bore of tool because it does not cause rust or corrosion. No need to clean barrel after every job! These quality Power Loads are subjected to multiple inspection during manufacture, are backed by Remington—a name well known to American sportsmen. No matter what powder-actuated tool you use, it will work better with Remington Power Loads!

Uniform performance and penetration are assured with precision-made 1/4" and 3/8" diameter Remington Studs. These high-strength studs are made with special molybdenum steel. Specify Remington Studs with exclusive green "Power-Guide" heads . . . for uniform performance and straight-driving penetration. Over 60 "job-rated" Studs to choose from—your assurance of a Remington "Power-Guide" Stud to fit every fastening application.

Remington know-how insures the quality of its Studs and Power Loads. No other company can offer the background of experience gained through the manufacture of billions of these units. When you order studs and loads, you'll get better performance if you specify Remington—maker of the most versatile fastening tool ever designed (right). We'll gladly send valuable free booklets about Remington Power Loads, Studs and fastening tools. Mail the coupon today!



Remington Model 455A Stud Driver

Remington



Remington Arms Company, Inc., Bridgeport 2, Conn.
IN CANADA: Remington Arms of Canada Limited,
36 Queen Elizabeth Blvd., Toronto 18, Ont.

Remington Arms Company, Inc., Bridgeport 2, Conn. CME-41
Please send—without obligation—catalogs on Remington Contractor & Industrial Tools checked:

☐ Stud Drivers ☐ Air Tools ☐ Chain Saws
☐ Concrete Vibrators ☐ Flexible Shaft Machines

Name _____ Position _____

Company _____

Address _____

City _____ Zone _____ State _____

Circle 211 on Reader Service Card



How come Joe can bid so low on those concrete jobs he's getting?



Uses UNI-FORM Panels. Says they're the fastest, cheapest method of forming concrete he's ever used.



Think he's right?



Don't know . . . I've sent for their new catalog to see what they're all about. Why don't you use the coupon down below and get your copy.



Thanks — I think I will.

.....
Send me a copy of the new
 Universal Catalog 761.
 NAME _____
 TITLE _____
 COMPANY _____
 ADDRESS _____
 CITY _____ ZONE _____ STATE _____
UNIVERSAL FORM CLAMP CO.
 1238 N. Kostner Avenue, Chicago 51, Illinois

Circle 212 on Reader Service Card

Advertisers' Literature

Listed below is free material offered in this issue's advertisements received up to March 15. To get the items you want, circle appropriate numbers on the SERVICE CARD inside the back cover.

BUCKET—A booklet covers Drott's "4-in-1" bucket, available on the Payloader serving as clamshell, dozer, scraper, and shovel.—Hough.

Circle 460 on Reader Service Card

CLIMBING CRANE—Literature describes the Concretor, which climbs by its own hoisting winch and has up to 100-ft radius.—B. M. Heede.

Circle 461 on Reader Service Card

LUBRICATION—The Lubriplate Data Book describes how to improve operation and reduce maintenance costs on machinery.—Fiske.

Circle 462 on Reader Service Card

BLASTING—A brochure supplies data about the use of N-IV ammonium nitrate and fuel oil mixture for blasting.—Spencer.

Circle 463 on Reader Service Card

FORMS—Catalog 400 describes Form-Crete's line for job casting, prestressed, and custom jobs.—Food Machinery & Chemical.

Circle 464 on Reader Service Card

POWER TOOLS—Catalogs describe stud drivers, air tools, chain saws, concrete vibrators, and flexible shaft machines.—Remington.

Circle 465 on Reader Service Card

BEARINGS—A 20-p. catalog illustrates steel-backed and solid aluminum bearings for Cat engines and equipment.—Monmouth.

Circle 466 on Reader Service Card

PILING—Catalog CM-10 gives details of a full line of piling—sheet, pipe, and H-beam—as well as driving accessories.—L. B. Foster.

Circle 467 on Reader Service Card

DREDGES—Bulletin 980 illustrates the Dragon portable dredge with a hull that can be assembled on shore or in the water.—Ellicott.

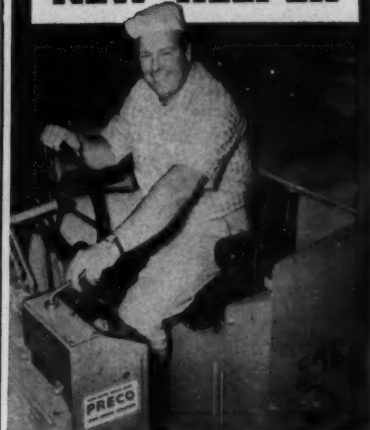
Circle 468 on Reader Service Card

TILT-UP DEVICE—Bulletin TU-4 describes equalizer for reducing stresses when lifting tilt-up panels.—Superior Accessories.

Circle 469 on Reader Service Card

MOTOR GRADER OPERATORS!

MEET OUR NEW HELPER



PRECO

AUTOMATIC BLADE CONTROL

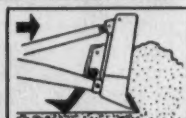
It's a slope-holder, time-saver, cost-cutter, and grading engineer! It gives me a third hand in the operation of my grader.

The PRECO Automatic Blade Control maintains cross slope accurately and AUTOMATICALLY! I just set the dial and go to work. It leaves me free to use my judgement — and both hands — to handle the material and produce a smooth longitudinal grade.

Effective on all work, from roughing in and spreading material to rigidly controlled fine grading, the PRECO Blade Control helps me get the job done easier, faster, more accurately, and at less cost. PRECO also helps me help my boss by permitting savings in engineering and staking costs — I need only one row of blue-tops for even the most precise grading. The PRECO also helps produce smoother surfaces; this, in turn, allows uniform thicknesses of base and paving materials, and substantial savings in both.

Proved, dependable, and easy to service, the all-transistor PRECO Automatic Blade Control is available on Caterpillar and LeTourneau-Westinghouse Motor Graders. Hire this efficient, productive helper today. Get a PRECO Blade Control installed on your motor grader now.

PRECO makes it easier for dozer operators, too! PRECO Back Rippers eliminate "deadhead" dozer reverse. They give you two-way, doubly-effective dozer production — forward and reverse. To look good in the cut and on the ledger get your tractors equipped with PRECO Back Rippers now.



DOZE IN FORWARD



RIP IN REVERSE

WRITE, PHONE, OR CABLE FOR ALL THE PRECO FACTS OR SEE YOUR PRECO DEALER





PRECO

INCORPORATED

4100 E. Slauson AVE., LOS ANGELES 22
 TEL: 400-0000, 400-0001

Circle 312 on Reader Service Card
CONSTRUCTION METHODS

MORE PAYLOAD*

 Up to 3% GREATER	 3% - 7% GREATER
 7% - 15% GREATER	 15% AND MORE

*Payload of WHITE 6264 compared with a conventional chassis with 13,000 lbs. on conventional front axle.

This WHITE BUSINESS BOOSTER steps up payloads in every state

This unique White 6264 means you get 3000 to 4000 lbs. more payload in most states—as much as 6270 lbs. in certain states. And wherever you operate, this rugged, powerful WHITE is specifically designed to do more work for you in less time at lower cost. Its compact, one-man cab with side-mounted engine provides larger CA

dimensions for best weight distribution. Its short turning radius gives greater maneuverability. It is specifically designed to permit optional 18,000-lb. front-axle loadings with minimum increase in chassis weight. Extensive use of aluminum cuts chassis weight without sacrificing famous WHITE ruggedness.

The White 6264 is built to fit your exact needs—to boost your payloads. Chassis is for use with the mixer or dump body of your choice. Ask about its specific advantages in your state.

THE WHITE MOTOR COMPANY
CLEVELAND 1, OHIO

Branches, distributors, dealers in all principal cities

WORLD LEADER IN HEAVY DUTY TRUCKS
WHITE TRUCKS
Circle 213 on Reader Service Card



Primacord®

**provides maximum safety and dependability
when using cap-sensitive explosives**

Primacord Detonating Fuse provides a continuous line of detonation of sufficient strength to initiate any cap-sensitive explosive with which it comes in contact. A Primacord downline in your hole will result in full-column detonation, because it initiates every cartridge in the hole. Deck loading is simplified. Bridged cartridges or other causes of load separation do not result in the hazard of unexploded powder in the muck.

Primacord is relatively insensitive. It detonates at a speed of almost four miles per second along its entire length. It cannot be set off by sparks or stray electrical currents — or by normal vibra-

tion, friction and shock. It is simple, easy and economical to use.

The Primacord downline can be attached to the trunkline by simple knot connections. The shot can be fired instantaneously — or holes can be delayed by surface techniques using Primacord M/S Connectors.

These advantages make Primacord the ideal initiator for a wide range of blasting applications both underground and open pit. It is available in a number of standard and special types developed to meet varying needs. For further information, consult your explosives manufacturer or write

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut • Since 1836
THERE IS A TYPE OF PRIMACORD® FOR EVERY TYPE OF BLASTING



Free! NEW GUIDE AND CONDENSED MANUAL: "PRIMACORD DETONATING FUSE...WHAT IT IS... HOW TO USE IT." ASK YOUR EXPLOSIVES MANUFACTURER OR WRITE US GIVING YOUR COMPANY NAME.



Circle 214 on Reader Service Card

AD LITERATURE...

Listed below is free material offered in this issue's advertisements received up to March 15. To get the items you want, circle appropriate numbers on the SERVICE CARD inside the back cover.

CASTINGS—Neenah's line of gray and ductile iron construction castings are depicted in a 168-p. catalog.—Neenah Foundry.

Circle 470 on Reader Service Card

WIRE ROPE—Bulletin 60100-R discusses 7-Flex, a wire rope that has 16% more wearing surface than a 6-strand rope.—Macwhyte.

Circle 471 on Reader Service Card

COMPACTOR — A brochure highlights the M-18 Masher, which hits with a force of 2,700 lb and travels up to 75 ft a min.—Muller.

Circle 472 on Reader Service Card

LUBER — The Graco Idea Book describes and illustrates typical equipment arrangements and how to job-plan a lube truck.—Gray

Circle 473 on Reader Service Card

MEGAPHONE—The Hailer, a transistor-powered portable megaphone, weighs only 5½ lb and runs on flashlight cells.—Audio Equipment.

Circle 474 on Reader Service Card

BRACKETS — The Mobil-Bracket Method that cuts masonry wall costs and increases speed is shown in Bulletin 54-A.—Safeway.

Circle 475 on Reader Service Card

TWO-WAY RADIO—A kit contains information on Motorola's two-way radios that can increase efficiency on every job.—Motorola.

Circle 476 on Reader Service Card

SIDEBOOM—A booklet explains the Sideboom, which lifts 6 tons at 4-ft overhang and is available on Pay-loader tractor-shovels.—Hough.

Circle 477 on Reader Service Card

FRONT END LOADER—Bulletin LM-1097 highlights the versatility and production of the Model 123 front end loader.—Eimco Corp.

Circle 478 on Reader Service Card

CLUTCH SYSTEM—A booklet describes Magnetorque, which employs magnetic force to control swings.—Harnischfeger.

Circle 479 on Reader Service Card

DIESEL ENGINES—Bulletin BU-718 describes Models 11000 and 10000, and BU-540 details the 21000 and 16000.—Allis-Chalmers.

Circle 480 on Reader Service Card

The Most Advanced Dredges in Their Class



Ellicott "Dragon"® Model Portable Dredges

Here's why:

1. These are dredges in which portability is a reality not a possibility. Patented hull disassembles quickly and can be reassembled on shore or in the water.
2. All components are designed and built by Ellicott whose centralized engineering and manufacturing responsibility insures quality control.
3. "DRAGONS" are completely electro-hydraulically operated with unified controls to facilitate handling ease, lessen operator fatigue and raise outputs. This kind of control was first introduced by Ellicott on portable dredges over 10 years ago.
4. All precision machinery easily accessible for servicing. Eliminates costly delay in maintenance of vital operating components.
5. "DRAGONS" are products of experience gained by a company which has concentrated on designing and building dredges of all types and sizes for 75 years. This know-how unequalled by any other dredge builder.

These and other exclusive Ellicott designed features spell out why today's rugged durable "DRAGONS" are recognized everywhere to be top performers as proved by their work on road construction, land reclamation, industrial pond clearance and waterway maintenance. To find out more about them, their accomplishments and how one is suitable for your construction operations, write for Bulletin 980.

Please fill in the handy coupon.



ELLICOTT DREDGES

ELLICOTT MACHINE CORPORATION, Baltimore 30, Maryland, U.S.A.; Ellicott-Brandt, Inc., Baltimore, Maryland; Ellicott Fabricators, Inc., Baltimore, Md.; McConway & Torley Corp., Pittsburgh, Pa.; Timberland-Ellicott, Limited, Woodstock, Ontario, Canada; Dragues Ellicott France, Paris, France; Dragas Ellicott do Brasil Ltda., Rio de Janeiro, Brazil; Ellicott de Mexico, Mexico City, Mexico.

Successors to the floating dredge business of the Bucyrus-Erie Company and the American Steel Dredge Co. Complete engineering, design and construction service.

ELLICOTT MACHINE CORPORATION

1605 Bush Street • Baltimore 30, Maryland

Send me a copy of Bulletin 980, describing "DRAGONS," "The Ultimate in Portable Dredge Engineering."

Name _____
Firm _____
Address _____
City _____ Zone _____ State _____ 2754

Circle 215 on Reader Service Card

DESIGN AND CONSTRUCTION OF PORTS AND MARINE STRUCTURES

Just Published. Here are practical facts and data for the design and building of modern harbor and off-shore marine structures. Ranges from survey of port growth—through economic factors and site location—to design of piers, mobile docks, drilling structures, etc. By A. DeF. Quinn, Fred. S. Sore. 529 pp., 307 illus., \$16.00

CONCRETE ENGINEERING HANDBOOK

Just Published. Gives you job-tested data and methods for efficient handling of concrete design and construction work. Full coverage includes reinforced-concrete, design of slab and girder bridges, cement pavements, foundations, etc. Edited by W. F. La Londe, Jr., Newark Coll. of Engrg. Asst. Ed., M. F. Jones, Consul. Engr. 619 pp., 173 illus., \$25.00

CONSTRUCTION ESTIMATES AND COSTS

Describes every detail of the estimator's job—how to accurately compute material, labor, equipment, and overhead costs, plus necessary profit. Revised edition covers all types of light and heavy construction, and includes new material on asphalt walks, driveways and pavements, plus modern data on wages and materials. Arithmetical methods for estimating costs are fully described and illustrated. By H. E. Pulver, Consul. Engr. 3rd Ed. 640 pp., 126 illus., \$12.00

ERECTING STRUCTURAL STEEL

Just Published. Tested time- and money-saving methods to help you plan and erect a wide variety of steel structures. Provides a working knowledge of types, descriptions and uses of equipment; tools and scaffolding; tested work methods; erection procedures; and the business aspects of estimating, selling, and managing. By S. P. Oppenheimer, Prof. Engr. 272 pp., 111 illus., \$9.50

ENGINEERING ECONOMICS FOR PROFESSIONAL ENGINEERS' EXAMINATIONS

Gives all the facts, formulas, and tables you need to save time and insure accuracy in answering virtually any question on engineering economics. Describes important aspects of the field, defines technical terms in finance and economics, and reviews essential mathematics. Exercises and problems from actual P. E. exams throughout the country are included—many with answers or worked-out solutions. By M. Kurtz, Prof. Engr. 260 pp., 80 illus. and tables, \$8.50

SEE THESE BOOKS 10 DAYS FREE

McGraw-Hill Book Co., Dept. CM-4
327 W. 41st St., New York 36, N. Y.

Send me book(s) checked below for 10 days' examination on approval. In 10 days I will remit for book(s) I keep plus few cents for delivery costs, and return unwanted book(s) postpaid. (We pay delivery costs if you remit with this coupon—same return privilege.)

- ☐ Quinn—Des. & Constr. of Ports & Marine Struc., \$16.00
☐ La Londe & Jones—Concrete Engr. Hdbk., \$25.00
☐ Pulver—Constr. Est. & Costs, \$12.00
☐ Oppenheimer—Erec. Struc. Steel, \$9.50
☐ Kurtz—Engr. Econ. for P.E. Exam., \$8.50
(PRINT)

Name _____
Address _____
City _____ Zone _____ State _____
Company _____
Position _____

For price and terms outside U.S., write McGraw-Hill Int'l., N.Y.C.

CM-4

Circle 216 on Reader Service Card

AD LITERATURE...

Listed below is free material offered in this issue's advertisements received up to March 15. To get the items you want, circle appropriate numbers on the SERVICE CARD inside the back cover.

TWO-WAY RADIO—Literature provides information on the LD, RCA's mobile, transistorized two-way radio.—Radio Corp. of America.

Circle 481 on Reader Service Card

CONCRETE ACCESSORIES—A catalog lists prices and describes the complete line of DSG accessories from ties to anchors.—Dayton.

Circle 482 on Reader Service Card

MATERIALS GUIDE—Friction Materials Guide, FM 35A, tells how to pick right materials for motion-control problems.—Johns-Manville.

Circle 483 on Reader Service Card

METALS SERVICE—Armco Construction Service, which provides crews and equipment for specialized jobs, is covered in a book.—Armco.

Circle 484 on Reader Service Card

TWO-WAY RADIO—Brochure features the Messenger, which has 23 channel coverage and instant choice of one of five channels.—Johnson.

Circle 485 on Reader Service Card

PIPE FITTINGS—Wedgelock couplings, which require only a hammer to connect and disconnect are subject of Bulletin 59.—Naylor.

Circle 486 on Reader Service Card

STEEL CORD TIRES—Booklet explains how tires with steel wire cord run 20 deg cooler, increase sidewall strength.—Bekaert.

Circle 487 on Reader Service Card

CONCRETING EQUIPMENT—Catalog 610 presents the entire Stow line, including the new SSG all-steel vibrating screed.—Stow.

Circle 488 on Reader Service Card

ROLLER—The Chief, with hydraulic steering and Roll-O-Matic drive, is detailed in Bulletin 410-A.—Galion Iron Works & Mfg.

Circle 489 on Reader Service Card

WELDING—Catalogs illustrate the line of oxy-acetylene and ac arc welding equipment and battery chargers and testers.—Marquette.

Circle 490 on Reader Service Card

PARTS—Conversion kits, ring sets, oil filter kits, and safety switches for Wisconsin engines are covered in Form S-280.—Wisconsin.

Circle 491 on Reader Service Card

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT — BUSINESS
EQUIPMENT — USED OR RESALE
OPPORTUNITIES

DISPLAYED RATE

The advertising rate is \$21.75 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

Employment Opportunities \$37.00 per inch, subject to agency commission.

An advertising inch is measured $\frac{1}{8}$ " vertically on one column, 3 columns—30 inches—to a page.

UNDISPLAYED RATE

\$2.10 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Positions Wanted undisplayed advertising rate is one-half of above rate, payable in advance.

FOR SALE COMPLETE CONCRETE PAVING SPREAD

- 1—34E Koehring Mixer
- 1—C. S. Johnson Automatic Bins and One Stop Batcher
- 1—Quad City Slip Form Paver w/ Maginniss vibrators
- 1—1yd. Crane w/ 2yd Clam Shell

REPLY

P. O. Box 275
Albuquerque, New Mexico

Circle 313 on Reader Service Card

FOR SALE OR LEASE

Lima 30-ton wagon crane mounted on Lima carrier. New in January, 1968. Equipped with worm driven boom hoist and 15-KW generator.

THE A. S. JOHNSON COMPANY
8311 Jennings Road, Cleveland 9, Ohio
Phone BH 1-6214

Circle 314 on Reader Service Card

EMPLOYMENT SERVICE

200-1,000 new positions reported monthly. Get free copy. National Employment Reports, 20 E. Jackson, 902-W, Chicago 4.

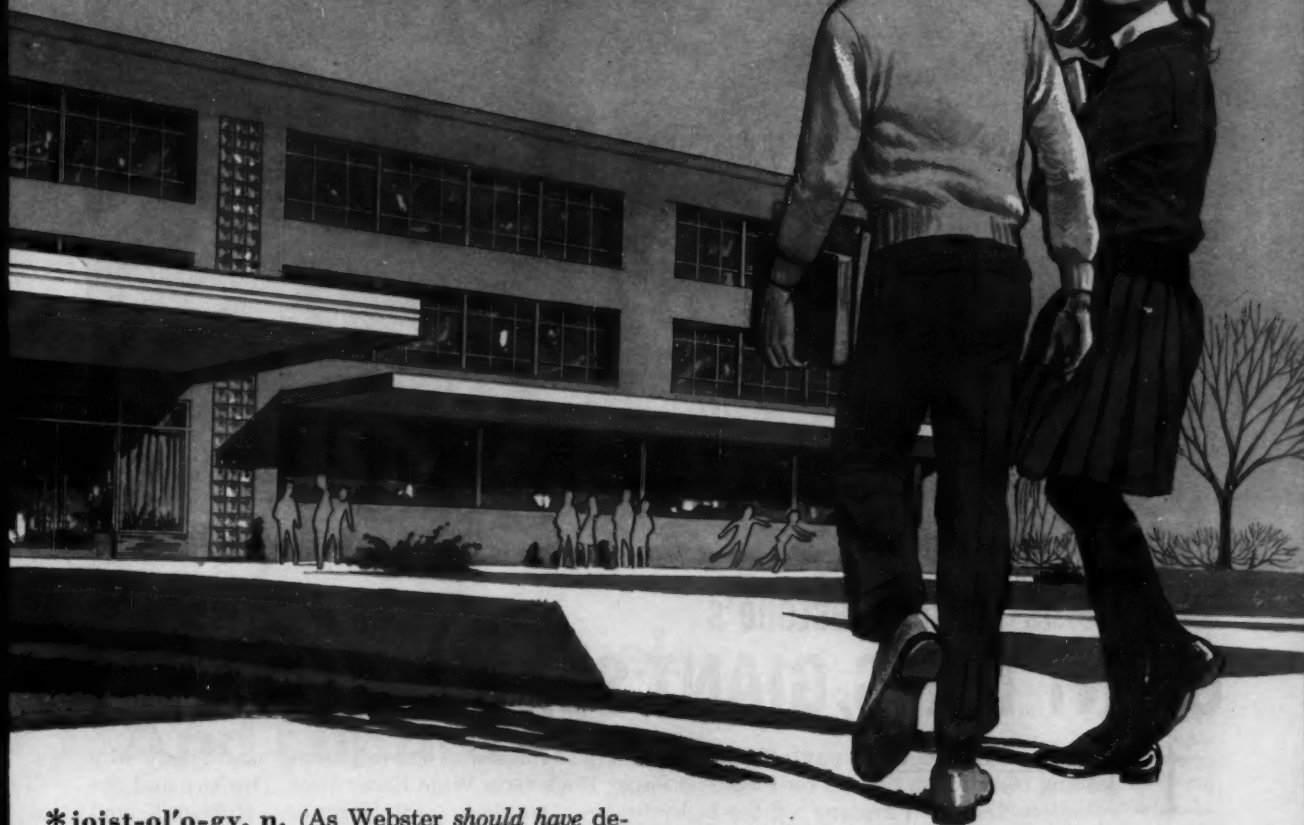
Your Inquiries to Advertisers Will Have Special Value . . .

—for you—the advertiser—and the publisher, if you mention this publication. Advertisers value highly this evidence of the publication you read. Satisfied advertisers enable the publishers to secure more advertisers and — more advertisers mean more information and more products or better service — more value—to YOU.

CONSTRUCTION METHODS

JOISTOLOGY*

**HAS HELPED
BUILD MORE SCHOOLS
FOR AMERICA**



***joist-ol'o-gy, n.** (As Webster *should* have defined it) The art or science of designing and building more economical structures through the use of open web steel joists.

Architects, engineers and school officials throughout the country have found that all types of school buildings—single or multi-story—can be constructed more efficiently and economically through the use of steel joist floors and roofs.

Steel joists have been used in more school buildings than any other type of construction, because of low material cost and equally economical placing and handling costs experienced with these all-purpose structural members—light in weight but long in span and adaptability.

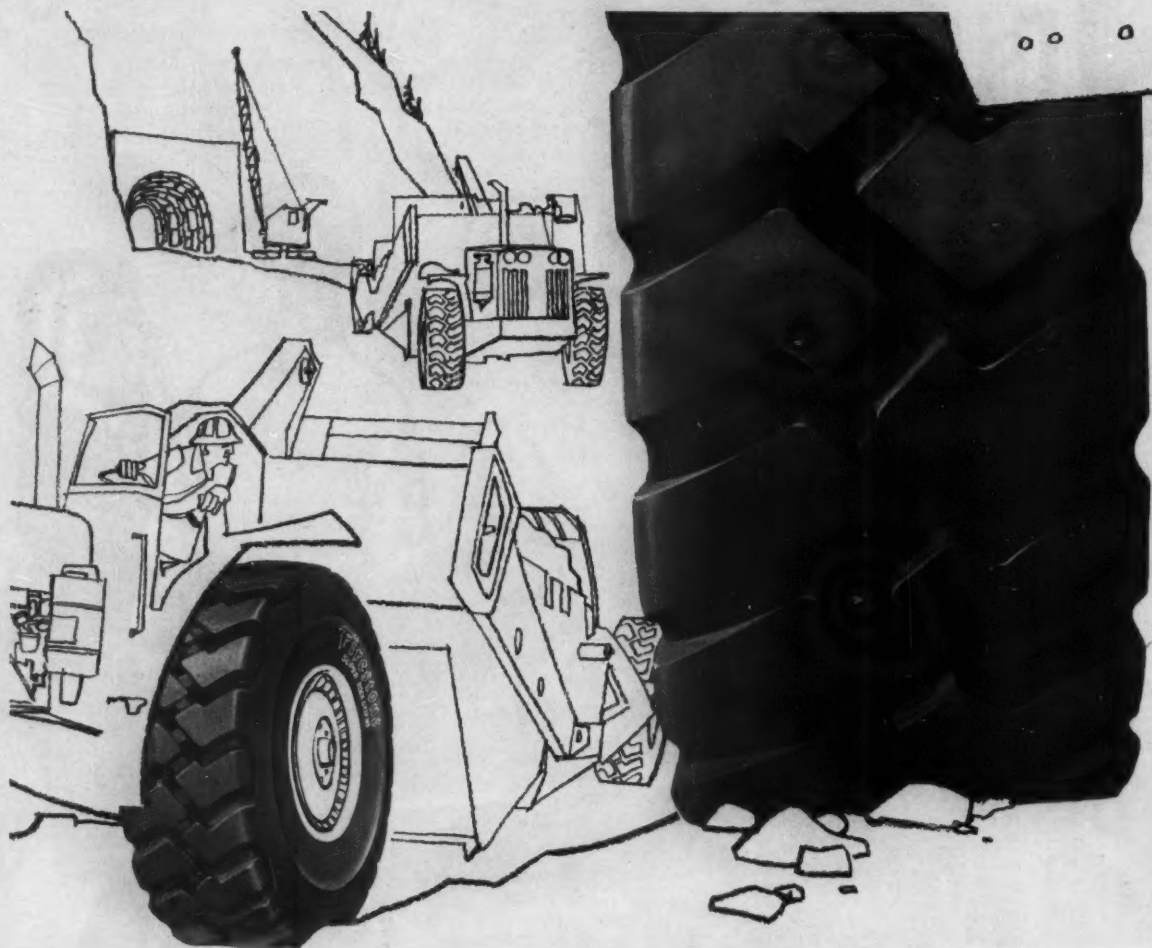
The continued specification of steel joists in school buildings will help make possible the completion of many

critically needed school structures within the budget of the community.

The Steel Joist Institute has published several helpful technical manuals on the construction, performance and application of open web steel joists, including specifications and load tables, and an open web steel joist catalog. The Institute will be happy to send you this material, on request, at no charge.



Another in a series of advertisements placed in the public interest by the
STEEL JOIST INSTITUTE, Suite 715, DuPont Circle Bldg., Washington 6, D.C.



Job records prove Firestone's **GIANT TIRES, GIANT SERVICE PAY OFF!**

1. **Firestone Giant Tires** pay off in terms of big savings with *extra* hours of use. That's why leading contractors depend on Firestone Super Rock Grip Wide Base* tires. This tire and the complete line of Firestone off-the-highway tires are built with Firestone Rubber-X and Shock-Fortified Nylon cord bodies to last longer.
2. **Firestone Giant Tire Service** is your best insurance against profit-robbing tire downtime. Firestone Tire Specialists give you complete, 24-hour, on-the-job service for every tire you own to keep equipment *working*. They'll spot tire troubles before they can get started . . . and do your tire worrying for you!

Find out how Firestone's unbeatable 1-2 punch . . . Giant Tires and Giant Tire Service . . . will turn downtime losses into worktime profits. See your Firestone Dealer or Store or write to the Manager, Off-The-Highway Tires, The Firestone Tire & Rubber Company, Akron, Ohio.

Always Specify Firestone Tires When Ordering New Equipment.

*Firestone T.M.

Firestone

FIRST IN OFF-THE-HIGHWAY TIRE NEEDS

Copyright 1961, The Firestone Tire & Rubber Company
Tune in Eyewitness to History every Friday evening, CBS Television Network

Circle 218 on Reader Service Card

Maintenance Shop . . .



LEFT SIDE—Compartment at front holds drum of gear oil, air hose with reel and drum of chassis lubricant. Compressor on truck engine feeds accumulator in rear compartment.



RIGHT SIDE—Pumps driven by dual power take-off on transmission feed reel-mounted hoses that dispense fuel oil and gas. Meters on top of body register fuel consumption.



REAR—Six air-operated gear pumps dispense motor oil, gear oil and chassis lube.

Mobile Rig Refuels And Lubricates

A DUAL PURPOSE RIG that refuels as well as lubricates equipment in the field is cutting downtime for the North Carolina Highway Dept.

The two-in-one unit has a 1,000-gal tank body mounted on a 19,000-lb Ford F-600 truck chassis. Bulkheads divide the tank into six compartments that hold gas and oil. Other compartments at the sides and rear of the body contain equipment for dispensing air, oil and grease. Approximate cost of the mobile rig is \$6,600.

The largest compartment of the tank holds 400 gal of fuel oil for diesel engines. Another compartment stores 300 gal of gasoline and four 75-gal compartments at

the rear of the tank contain motor oil.

On the right side of the truck, a front compartment contains two 25-ft hoses with reels and nozzles for dispensing fuel oil and gasoline. A filter with paper-type element cleans the fuel oil to protect diesel injectors against dust and other sources of contamination. Two meters mounted on top of the front compartment record fuel consumption. Another compartment on the right side of the vehicle stores oil filter elements and dry-type air filter elements.

Pumps for fuel oil and gasoline are driven by a dual power take-off on the truck transmis-

sion. The pto clutch is air-actuated by a lever on the side of the truck.

The truck also carries a 55-gal drum of gear oil, an air hose and reel, and a 125-lb drum of chassis grease. Air-operated pumps are mounted on top of each drum.

In a rear compartment on the left side is a 230-cu-ft container of compressed air. It accumulates air supplied by a 12-cfm compressor mounted on the truck engine. This system powers all air pumps for dispensing lubricants and feeds the air hose used to inflate tires.

At the rear of the truck are six reel-mounted hoses with no-drip connections on each nozzle. Four air-operated 18-gpm rotary gear pumps with 40-ft-long high-pressure hoses dispense motor oil. Meters show individual and accumulated draw-off. The compartment also contains a reel and hose for high-pressure chassis lubrication and a reel with low-pressure hose for gear lubrication.

**"Euclid scrapers have tripled our yardage
...cut cycle time 60%"**

**"In 3 years only two day's downtime
for each of our 3 'Euc' Rear-Dumps"**



W. A. Schemmer Limestone Quarry, Inc. at Logan, Iowa produces 1500 tons of crushed stone per day... close to a half million tons annually... for highway construction, river stabilization work and agriculture. Up to 70 feet of overburden has to be removed from the 30 feet of limestone.

Replacing crawler-drawn scrapers, two Euclid TS-24 Scrapers are now used for stripping. They have greatly reduced costs on this phase of the operation. Cycle time from the stripping area to spoil bank and return has been reduced by 60% and yardage moved per hour has more than tripled. First major repair work was done after 4000 hours of operation on the first "Twin" that went into service in January of 1957. There has been no downtime on the other "Euc" that has

been working 17 hours a day since April, 1960.

On a half-mile round trip from the loading shovel to the crusher, three R-10 Rear-Dump "Eucs" haul a total of 1500 tons per 10-hour day. Working an average of 250 days a year, these 10-ton haulers have posted a fine availability and low maintenance cost record. In three years of operation the 3 "Eucs" have required no major overhaul and there has been only two days of downtime for each machine during that long period.

Prior to going into the quarry business in 1948, Mr. Schemmer had his own highway construction firm so he speaks from long experience with heavy equipment when he says, "The extremely low operating cost of our Euclid scrapers and trucks has been a major factor in the success of our quarry operations".



EUCLID

DIVISION OF GENERAL MOTORS, HUDSON, OHIO
Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland



"Two Euclid TS-24 Scrapers and three R-10
Rear-Dumps enable us to turn a profit stripping
70 feet of overburden for 30 feet of limestone".

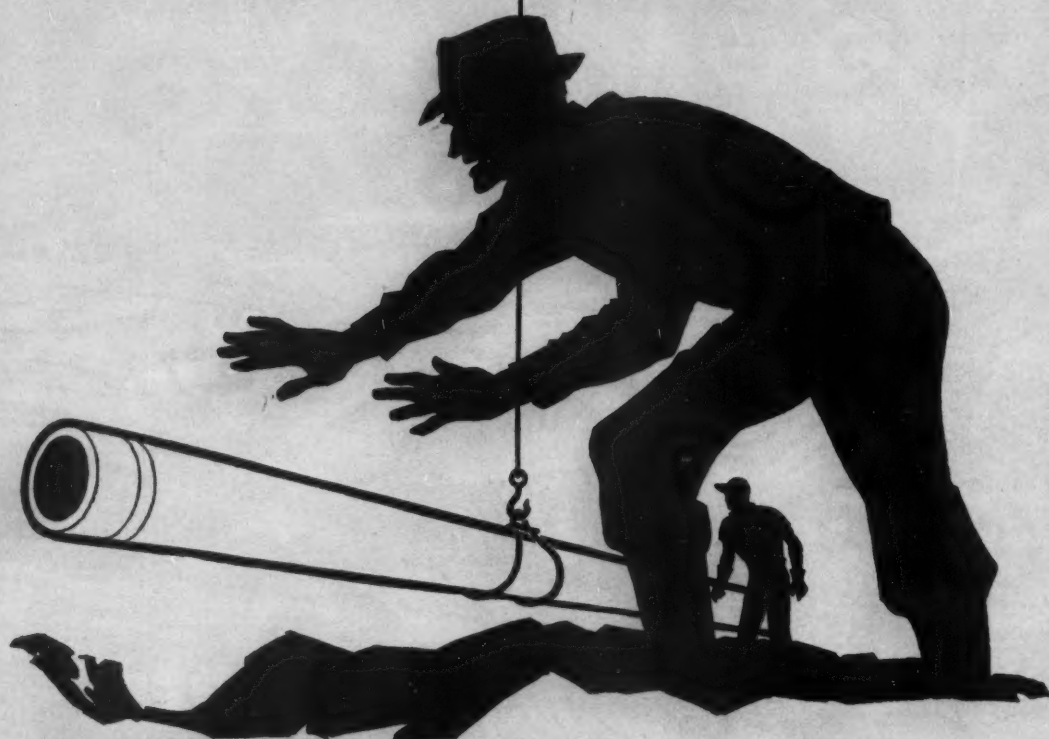
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and Lanarkshire, Scotland*



A contractor from Arizona reports:



“In only 8 hours, we installed 7,100 feet of Transite Water Pipe.”

Jay Baldwin, Supervisor,
E. P. Hunziker Construction Company, Tucson, Arizona



“We achieved the phenomenal installation rate of up to 947 feet in one hour on a 12-mile Transite Water Pipe job for the Oracle Village Water Company. Since the job called for stringing out the pipe, excavating, fine grading the trench bottom, installing,

testing and backfilling, it took a well-planned operation and excellent teamwork by everyone concerned to get this rapid installation. Of course, a very large part of the credit has to go to Transite Pipe itself. Its long lengths, light weight and speedy coupling methods got the job done quickly, with a minimum of effort and with virtually no manual handling of the pipe.

“After completing each 1000 feet, we tested the line. The result? Not one leak in the entire 12 miles. I’m convinced that for fast, sure results, you can’t beat Transite Pipe.”

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Methods Memo...



It Does Everything

The U.S. Army Engineer Research and Development Laboratories at Fort Belvoir, Va., are testing a multi-purpose crawler tractor that handles a variety of earthmoving chores. Its builder, International Harvester Co., bills it as a dozer, scraper, grader, cargo carrier, dump truck and high-speed primemover—all in one.

Called the Universal Engineer Tractor, the rig is powered by a 250-hp V-8 gas engine located at the rear. Each of the eight wheels on the fully tracked vehicle is individually sprung by hydraulic rotary actuators and gas springs. In a solid (unsprung) state, the rig performs earthmoving duties; with springs adjusted, it can travel on highways at speeds up to 30 mph.

A self-loading bowl at the front of the UET can be filled with dirt or other ballast to double the weight of the unit to provide a drawbar pull of 17½ tons. When the rig is used as a scraper, a hydraulically operated gate ejects and spreads the bowl's load.

The Book Says...

A kibitzer's handbook will spell out construction operations for sidewalk superintendents watching foundation work on a 29-story office building in lower Manhattan. The 16-p. booklet illustrates foundation techniques with sketches and diagrams. Owner-builder Sam Minskoff & Sons, Inc., of New York, issued the booklet.

Helicopter Blows Snow Off Slab

The Meinecke-Johnson Co. of Fargo, N.D., solved an unusual snow-removal problem this winter with a helicopter. A 2-in. snow fall blanketed the plastic sheeting covering a 12,000-sq-ft floor slab they had just poured. The framework supporting the plastic film was not strong enough to support workmen sweeping off the snow. How to do it? Charter a helicopter to blow off the snow. The whirlybird did the job in just 15 min.

Drill Rig Ready for the Moon

A drill rig devised by Garrett Corp. of Los Angeles will determine the composition of the moon's surface long before contractors start digging there. If it works, the rig will soft-land on the moon and bore holes in its crust. A television set will record findings and report them back to earth. The moon rig is about 10 ft tall and weighs 300 lb on earth; on the moon it will weigh only 50 lb.

Man Bites Dog Department

Members of Plasterers Local No. 2 of Los Angeles turned down a wage boost of 12¼¢ per hr last month, and they were not holding out for more money. Satisfied with the \$4.25 per hr they are now earning, the union members voted to decline a raise that was due May 1 under the union's contract with the Contracting Plasterers Association.

Why such magnanimity? Local president Burt Chapman offers these reasons: to back President Kennedy's plea to hold the line against inflation; to stimulate the use of genuine lath and plaster; and to keep building costs down.

"If other building trades go along with us," Chapman says, "it will stimulate construction."



Working Wife Earns Her Keep

Mrs. Esta Belle White, the petite wife of construction man Dick White, doesn't believe in sitting at home while her husband operates heavy roadbuilding equipment. The working partner of White Excavating Co. of Madison, Ohio, she keeps the family firm going by installing septic tanks while her children are at school.

Mrs. White handles everything from ditch digging to installation of asbestos-cement pipe. An accomplished operator, she handles the firm's Ford tractor with backhoe and front-end loader with the best of them. In addition she maintains equipment and makes cost estimates.

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- R6** A 36-page booklet in which 15 service manuals explain proper maintenance of crawler tractors, rollers, compressors, trenchers, crushers, asphalt plants, loaders, air tools, pavers, and other tractors.

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- R8** A 12-page booklet by a construction expert explains the importance of a sound insurance program, how to strengthen liability coverage...how to protect your property and your property. Included is a checklist for contractors.

SURETY BONDS...Their Function, Value and Effectiveness

- R9** An 8-page article discusses the difference between bonds and insurance coverages, tells how surety is rated, and describes various types of surety bonds.

BLASTING AGENT SLASHES POWDER COSTS BY 25%

- R10** This editorial reprint deals with a blast agent that slashes powder costs to 4.5 cents per yd of rock.

R19 PROFITABLE FIELD LUBRICATION PRACTICES

Contractors' practices and mobile lubrication are covered in a 16-page booklet that describes a simplified lubrication program and the equipment maintenance company and contractor.

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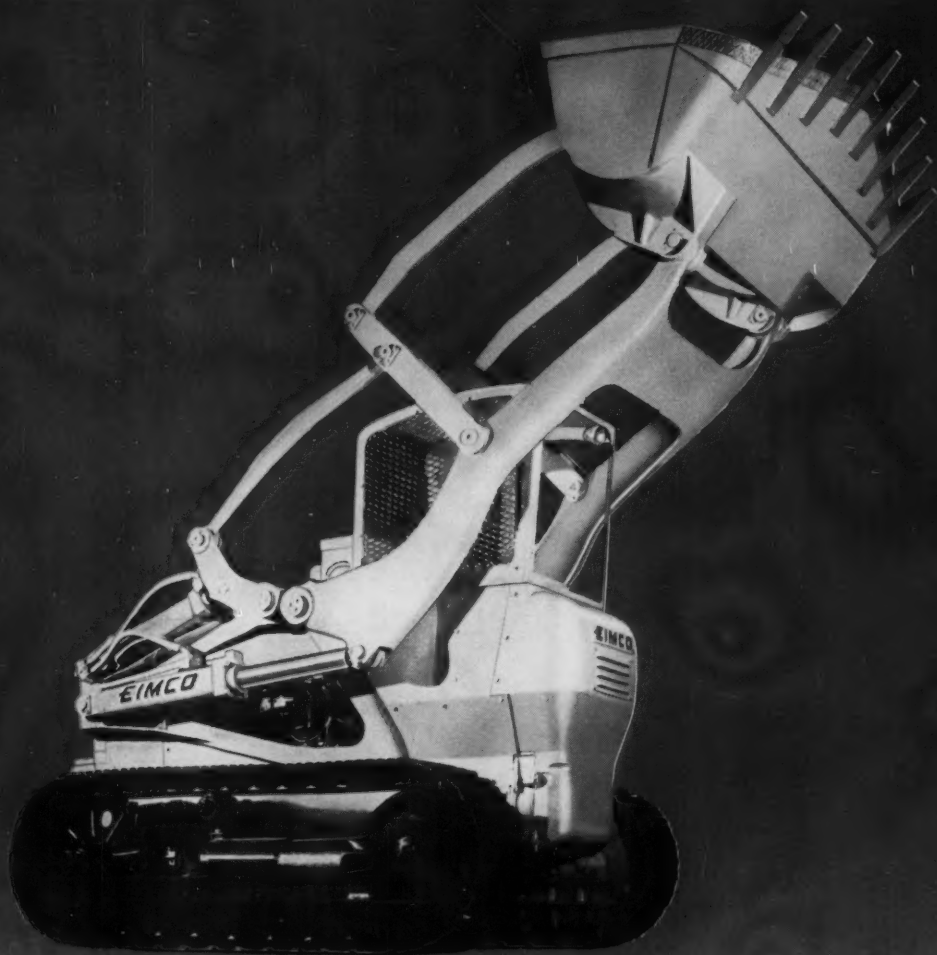
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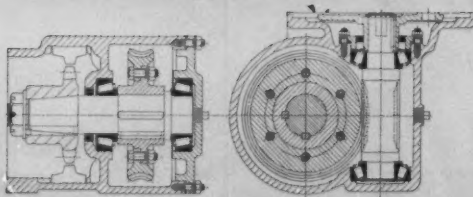
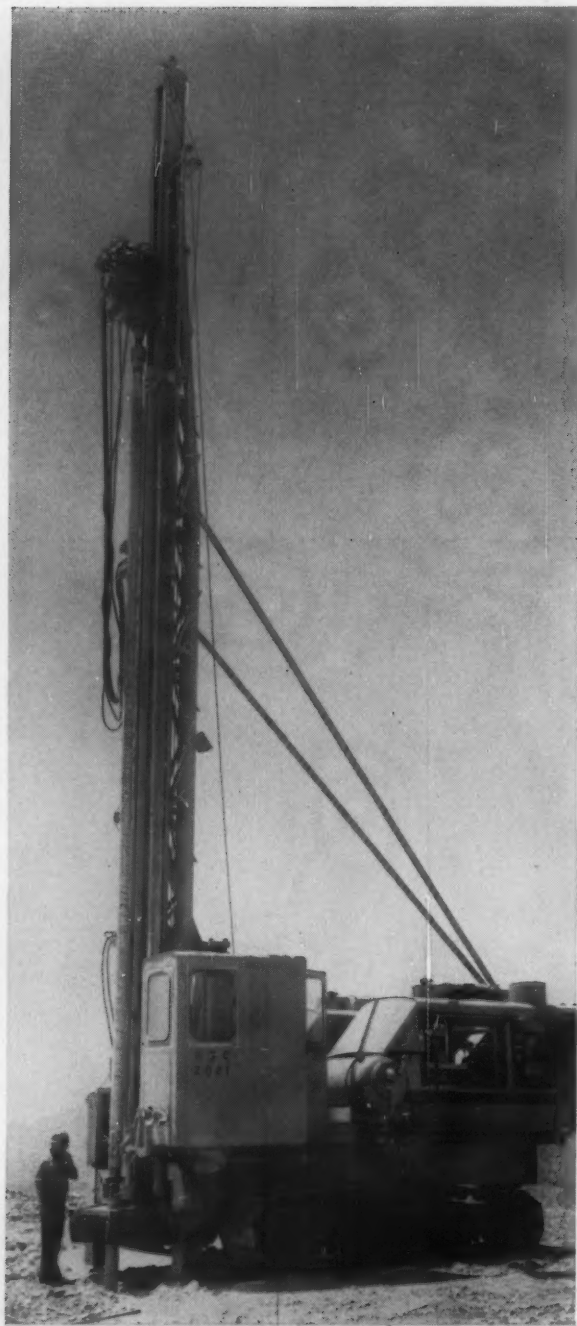
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